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A
DISSERTATION
ON THE
OBSTETRIC FORCEPS.

A
DISSERTATION
ON THE
STRUCTURE
OF THE
OBSTETRIC FORCEPS,

POINTING OUT ITS DEFECTS,
AND ESPECIALLY OF THOSE WITH
DOUBLE CURVED BLADES:
AT THE SAME TIME,
SHEWING PARTICULARLY THE SAFE APPLICATION
OF THOSE WITH
SINGLE CURVED BLADES,
AS GEOMETRICALLY
PROPORTIONED AND CONSTRUCTED:
AND LIKEWISE,
Shewing the Neceſſity and good Effects of ſeveral new
Forms of the SINGLE CURVED BLADE,
AS THE
NARROW, FANGED AND REFLECTED,
IN
CERTAIN CASES OF RETARDED LABORS:
TOGETHER WITH
Cautions, Remarks, and Reflections on the Conduct and
Management of Labors in general.

BY R. RAWLINS, SURGEON, Oxford.

Feſtina lentè——
Sat cito, ſi ſat bene——

LONDON:
PRINTED FOR THE AUTHOR;
AND SOLD BY B. AND J. WHITE, FLEET-STREET.

1793.

TO

MARTIN WALL, M.D. F.R.S.

FELLOW OF THE COLLEGE OF PHYSICIANS, LONDON;

AND

LITCHFIELD'S CLINICAL PROFESSOR OF PHYSIC

IN THE UNIVERSITY OF OXFORD.

As a teſtimony of regard, with the ſincereſt thanks for his attention and great benefit received in ſeveral caſes of ill health from his medical knowledge and judgment; and likewiſe, for the great reſpect to his qualifications and abilities, in Literature, Science, Arts, &c. in general, this Diſſertation on the Structure, &c. of the Forceps, as adapted for the Delivery of Women in certain Caſes of retarded Labors, is very gratefully, and with all due regard, reſpect, &c. humbly inſcribed,

By his moſt obliged Servant,

THE AUTHOR.

OXFORD,
March 1, 1793.

To the PUBLIC.

As an apology for this publication the Author thinks it neceſſary to obſerve, that whoſoever ſuppoſes he has made an improvement in any art, &c. ought undoubtedly, as a good citizen, to communicate it to the world for the benefit of his fellow creatures.

Actuated by this principle, and induced by thoſe of humanity, to ſave the lives of infants; to mitigate and alleviate the pain and diſtreſs of women in parturition; to prevent their receiving any injury during that ſtate, and conſequently to promote their happy, ſafe, and perfect recovery; and alſo to obviate anxiety in the mind of every good, careful, and humane practitioner:

tioner: the Author publiſhes this Diſſertation, regardleſs of cenſure as to its incorrectneſs or inelegancy of language. It is truth only he wants to expreſs, and that in the moſt natural and plain manner, though perhaps with ſome neceſſary tautology.

ERRATA.

Page 4. Line 19. *for* that it evidently ſhews, *read* as evidently to ſhew.
—— 10. —— 1. *for* ends, *read* end.
—— 26. —— 1. *for* may, *read* muſt.
—— 31. —— laſt, *for* nay, *read* though.
—— 44. —— 9. *for* tinctura, *read* infuſum.
—— 53. —— laſt, *for* thus happily the hæmorrhage ceaſes; *read* then happily the hæmorrhage will ceaſe.
—— 64. —— 8. *for* will with more caſe, *read* will gradually with very little pain.
—— 66. —— laſt, *for* as prolapſus uteri, *read* as procidentia vel prolapſus uteri.
—— 109. —— 13. } Draw a ſmall ſtroke with your pen under the letter a: thus $\underline{\text{a}}$
—— 110. —— 6. }
—— 111. —— 8. }
—— 112. —— 6. *for* be ſo regularly or to ſo good a purpoſe accompliſhed, *read* ſo regularly or to ſo good a purpoſe be accompliſhed.
—— 116. —— 21. after the word length, *add* reflection.

A DIS-

A
DISSERTATION
ON THE
OBSTETRIC FORCEPS, &c.

TO

DR. WALL.

SIR,

PERMIT me to lay before you a ſhort diſſertation on the ſtructure and application of an inſtrument, called the Forceps, as adapted for the delivery of women, in certain caſes of retarded* labors; with ſome cautions, remarks and reflections, as to the conduct and management of labors in general.

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* Thoſe commonly called tedious, lingering, laborious, difficult, &c. I call here (and ſhall hereafter claſs as) retarded labors, as evidently depending on ſome cauſe retarding the natural expulſion of the child.

With reſpect to the real inventor of the Obſtetric Forceps, I will not pretend to ſay who he was, but I am confident that he deſerves the higheſt praiſe, and the ſincereſt and moſt grateful thanks from every woman; for, undoubtedly, he very humanely conſidered the painful, and often deplorable ſtate of women in labour; and ſhuddered at the indecent modes that were then uſed, and at the cruel, horrid, and often ineffectual means, that were at that time taken to deliver women, and to extract the child.

As a good, careful and attentive practitioner, he not only wiſhed to ſhorten and mitigate the agonizing pains of labour, but he alſo very wiſely conſidered the great importance of ſaving a child's life; to effect theſe purpoſes he muſt have very attentively compared the ſhape of an infant's head with the figure of the female pelvis, and as judiciouſly ſuppoſed, that, if in certain caſes of retarded labors the child's head could be incloſed or encompaſſed between two pieces or blades of ſmooth poliſhed iron ſemielliptically bent, the longitudinal ſhape of the child's head might gradually be drawn down, and as effectually be turned into the long or tranſverſe diameters of the female pelvis, and thus the child might be ſafely delivered alive, and that without any injury to the mother.

Such then, it is natural to ſuppoſe, were the firſt ſuggeſtions or thoughts of the real inventor of the Obſtetric Forceps, ; but, let this be as it may, it is evident, that the invention of the Forceps was much earlier than it is in general imagined, though commonly aſcribed to Dr. *Chamberlain*; but of this there is no poſitive proof, and indeed it is ſomewhat evident, that he was not the real inventor of it; for though *Chamberlain* and his ſons followed the practice of midwifery, they only aſſerted, like many other practitioners in thoſe days, that they were in poſſeſſion of a ſecret inſtrument, by which they could readily deliver, beyond all other practitioners at that time, with the utmoſt ſafety to the mother and child, whatever lingering, laborious, or dangerous caſe of labor the woman might then be ſuffering under; but notwithſtanding all this boaſting, in a particular caſe of this kind, one of the *Chamberlains* was foiled at Paris, whither he went to perform prodigious feats of delivery beyond, in his own imagination, what the *French accoucheurs* could do. Now this very failure of *Chamberlain*'s ſon evidently proves, even though his inſtrument had been the Forceps, that he knew nothing of the principles of it, and it likewiſe proves that his family was not the real* inventor of it; for if it had been ſo, the *Chamberlain*, who went to Paris, would have been properly acquainted with the figure or ſhape of the child's head, and have known perfectly well the ſtructure of the female pelvis, conſequently would have compared them together, and would have then known, in the caſe he attempted to deliver at Paris, the true preſentation of the child's head, and the circumſtances of the mother, whether the pelvis was diſtorted or not, and accordingly would have omitted, or would have properly applied his inſtrument ſo as not to have been foiled.

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* It may here be acknowledged, that the inventor of any kind of inſtrument may not know all the real uſes and applications of it, he may only have invented it under his own particular idea to anſwer that one purpoſe; ſo it may be ſaid that *Chamberlain* may have only invented the Forceps merely under the idea of laying hold of the child's head, and thus to extract it however forcibly; but I cannot think ſo, for the Forceps in its ſtructure is ſuch, ~~that it~~ as evidently to ſhew, that the real inventor of it muſt have had more ideas than this, for he muſt have in its conſtruction very minutely conſidered the ſhape and ſize of the child's head, and ſtructure of the female pelvis, and accordingly have applied them together, and fitted the figure of the Forceps thereunto, conſequently muſt have known the true application and uſe of it, whereas the *Chamberlains* did not, for

But without meaning any cenſure on the *Chamberlains*, I ſhall declare, that he who attempts to keep any important invention, as the Obſtetric Forceps certainly is, a ſecret from the world even during any part of his life, deſerves not the honour of it; but he only who generouſly publiſhes it for the general good of his fellow creatures:

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for by their practice it ſeems that they introduced their inſtrument at random, and extracted the child's head by mere force.

hence the merit of the invention of the Forceps for the delivery of women in certain caſes of retarded labors, ought to be given to Mr. *Chapman*; for it was he who voluntarily firſt gave it to the world, though after deſcribing its form and explaining its uſe, he with great modeſty declares, that it was the ſecret inſtrument of the *Chamberlains*, but yet this does not prove *Chamberlain* to be the real inventor of the Forceps; however admitting it, though there is much to be ſaid againſt it, it is nevertheleſs evident, that the Forceps, as deſcribed by *Chapman*, had many defects; for, firſt, its blades were too broad, which hindered them from being eaſily and readily introduced. And ſecondly, their curvature was too circular, which, on any very little preſſure of the handles, would occaſion their ends to lacerate or bruiſe the ſides of the infant's head. And thirdly, beſides theſe defects, the two ſides of the Forceps were to be joined or faſtened together by means of a ſcrew, and which could not always be accompliſhed; ſo that from this laſt defect, it is but natural to ſuppoſe, that in ſuch caſes requiring the uſe of the Forceps, practitioners at that time, though very injudiciouſly ſometimes, inſtead of ſcrewing the ſides of the Forceps together, tied the two ſides together with a ſtring, &c. from which many evils and much injury to the woman muſt have frequently ariſen; either from the unſteadineſs of the blades, their turning aſide, or ſlipping off, and thus materially hurting the internal parts of the vagina, &c. But fourthly, the greateſt defect of *Chapman's Forceps* was in its length, not only of its blades, but more eſpecially of its handles, which undoubtedly were too long; for altogether it gave them too much power, not in extracting the child's head, but in their lever, by which they were very liable to produce a violent compreſſion at their fulcrum, on the bones of the pelvis, when the handles were ever ſo little inclined out of the deſcending axis of the pelvis; hence much injury to the woman.

With all theſe defects, the Forceps with very little alteration or amendment continued until Dr. *Smellie*'s time, for it was he who very ingeniouſly and prudently contrived to lock the ſides of the Forceps together in a very handy, convenient and ſteady manner; he alſo leſſened the curvature of the blades, and very judiciouſly ſhortened not only the blades, but alſo very materially the handles; for it muſt be obſerved, that in delivering with the Forceps, the handles ſhould be ſo uſed, as never to occaſion any preſſure from the blades on the bones of the pelvis, for whenever that happens, as from the forcible and injudicious working of the handles of the Forceps from * ſide to ſide in the extracting of the child's head, a certain point on the vagina, and other parts contiguous and lying beneath it, will be exceedingly compreſſed, bruiſed, or lacerated, by ſuch abſurd and violent actions of the Forceps; and hence from ſuch contuſions, &c. much miſchief will ariſe, as inflammation, ulceration, &c.

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* As generally directed by moſt authors, and followed by moſt practitioners. *Horrid actions!*

nay mortification, and even death itſelf; all which ſhort handles, &c. to the Forceps will generally, if not always, prevent.

Hence, to avoid ſuch accidents and miſfortunes, Dr. *Smellie* thought it proper to alter the ſhape, length, curvature, &c. of the Forceps then in general uſe; but, nevertheleſs, though *Smellie* very carefully and judiciouſly altered the Forceps in almoſt every part, yet, as he gave not curve enough to the blades (the diſtance between them in their middle, when the two ſides were locked together, being little more than two inches), their ends in conſequence thereof came nearly cloſe together, ſo that, therefrom, they are not only very apt to lacerate, but may compreſs the head ſo violently as even to kill the child, particularly in the hands of the haſty and injudicious practitioner, who very inattentively too cloſely and ſtrongly ſqueezes the handles together in extracting the child's head.

But theſe accidents may in a great meaſure be prevented, and theſe defects of *Smellie's Forceps* may be removed, by giving the ends of each blade an expanſion of the four tenths of an inch from the axis of their handles, and alſo by curving each blade nearly in their middle to the diſtance of an inch and the four tenths of an inch from the ſaid axis, and that merely by a little more ſuddenly bending outwardly the ſhank of each blade juſt above the groove of the locking part, and then immediately therefrom making the curve of the blade nearly to correſpond to the ſegment of a quadrant, whoſe radius is about four inches and a half; ſo that when the two ſides of the Forceps are locked together, the blades ſhall ſtand ſeparate from each other at their ends about the diſtance of eight tenths of an inch, and nearly in the middle of their curvature about two inches and eight tenths of an inch, that is, nearly three inches; for cloſer than this no child's head of a common moderate ſize can with ſafety be compreſſed, and if the ends of the Forceps' blades are ſet wider, and their curvature leſs, the Forceps would ever be liable to ſlip off. Hence whenever in future I ſhall mention the ſingle curved Forceps, I hope to be underſtood that I mean Dr. *Smellie's* common Forceps thus altered, and which I ſhall at the latter end of this Diſſertation attempt geometrically to conſtruct and delineate as in Fig. 1 and 2.

But further with reſpect to the Forceps it muſt be obſerved, that ſince Dr. *Smellie's* time, Dr. *Oſborn* has alſo thought it proper to make ſome other alterations in the blades of the Forceps, not only in extending their length near half an inch, but alſo in expanding them to the diſtance of three inches in the middle of their curvature, and ſetting their ends to the diſtance of the ſix tenths of an inch when the ſides are locked together; and beſides this, he has alſo very conſiderably widened the blades in their breadth to one inch and the ſix tenths of an inch, and gave them a kind of double, or rather a triple curvature (in imitation of *Leveret's Forceps*), gradually inclining from the ſhank juſt above the locking part, to almoſt the top of each blade, nearly to the diſtance of two inches from the common axis or ſtraight line through the middle of the handles; and to make theſe alterations it ſeems that he has been induced, from a ſuppoſition that the blades thus formed are more convenient to apply*, more aptly fitting the child's head, and conſequently more effectual in extracting it.

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* How far Dr. *Oſborn* has found the double curved Forceps preferable to the ſingle curved Forceps I cannot ſay, but I think that he is much miſtaken therein; the reaſon which he teaches for ſuch double curved blades being more conveniently applied, is that of not requiring the perinæum in their introduction to be ſo far diſtended backwards as the ſingle curved do; but this is not abſolutely true, for in thoſe preſentations requiring one blade to be introduced towards the pubes, and the other towards the ſacrum, the perinæum muſt then, for their proper introduction and ſafe application, be drawn equally as far backwards as if the ſingle curved blades had been introduced; for the double curve, being in a contrary direction with that of the handles, cannot have the effect which the Doctor mentions; and beſides, it muſt be obſerved, that when a woman has been in labour ſo long, as the caſe to require the aſſiſtance of the Forceps, the perinæum is then generally ſo relaxed as to diſtend backwards eaſily, even further than what is generally wanted to introduce the ſingle curved Forceps, hence this reaſon is vague and futile.—And further, it is very evident that the blades, when double curved, cannot in every preſentation more aptly fit the head than the ſingle curved; in ſome preſentations of the face they may perhaps be equally ſo, but in others the ſingle curved blades are in this very reſpect by far preferable. And, with reſpect to the double curved blades being more ſafe and

But

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and effectual in the extraction of the head than the ſingle curved blades, I ſhould think, on a very little reflection concerning the axis of the double curved Forceps, that it would immediately appear to every one to be a miſtake; for, let us ſuppoſe that in extracting the child's head with the double curved Forceps, the chief hold of the Forceps muſt certainly be very near the ends of the blades, conſequently the axis on which the power in extracting depends, muſt proceed in a ſtraight line acroſs the curvature from the ends of the blades to the handles, which is in fact the direct action of the ſingle curved Forceps.—What advantages or ſuperiority then has the Forceps with double curved blades over that which is ſingle curved in its blades? Certainly none; but, on the contrary, the double curved Forceps has its defects, as it may, for the reaſon juſt given, very much deceive the operator in the axis in which he is to direct the power of his inſtrument when extracting the head, and therefore, inſtead of facilitating the delivery, may retard it, and render it more painful, as drawing and preſſing the head into a contrary direction to what the operator intended; and again, it may deceive the operator even in introducing the blades; for as it is the invariable rule with Dr. *Oſborn* always to place the convex edge of his Forceps towards the infant's face, ſo in face preſentations towards the pubes, in thus introducing ſuch double curved blades, their ends will be very apt to be forced,

unthinkingly,

But notwithſtanding all theſe alterations in the Obſtetric Forceps, and although granting that the double curved Forceps of Dr.

unthinkingly, againſt the upper part of the ſacrum or projection of the lumbar vertebræ, and there hurt the woman, and this merely owing to the double curvature of the blades deceiving the operator in the axis of the Forceps: whereas the ſingle curved Forceps would freely paſs up over the ears of the child in the middle or direct axis of the pelvis, conſequently not ſo liable to injure any part therein. But not to mention at preſent any more ſuch inſtances which tend to prove that the double curved Forceps is not by far ſo ſafe and effectual as the ſingle curved Forceps in many caſes of retarded labors, I ſhall now only point out an omiſſion of Dr. *Oſborn* reſpecting his double curved Forceps, and then any candid practitioner may readily judge how very attentively the Doctor has conſidered the ſtructure and application of his double, or rather triple curved Forceps; in the engraving of it in his plate, he has only given us the view of one ſide of it, not conſidering that, if any future or foreign artiſt was to attempt to make a pair of double curved Forceps therefrom, the ends of the two blades, when locked together, would point different ways, inſtead of being oppoſite to each other; this Dr. *Oſborn* will find to be true, if he will be ſo kind as once more to take a view of the different curvatures of his Forceps' blades, one evidently inclining over the groove of the locking part, the other turning from it; it therefore behoves the Doctor, in his next or ſecond edition of his

Dr. *Oſborn*, and the ſingle curved Forceps of Dr. *Smellie* altered as juſt now mentioned and deſcribed, page 10, and ſhewn in Fig. 1 and 2, may be very applicable, ſafe and effectual, in many caſes of retarded labors, yet there are certain other caſes of this kind, in which their blades cannot be very readily introduced, or very ſafely applied; therefore further to remove theſe defects in the Obſtetric Forceps, and to render the blades more convenient and eaſier to be introduced; I have thought it proper to contract the breadth of one blade of the ſingle curved Forceps into a narrow blade not more towards its end than one inch, as in Fig. 3. And I have alſo thought it proper to divide one blade of the ſingle curved Forceps into two ſeparate parts, the fangs of which are each in breadth about three

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his Eſſays on the Practice of Midwifery, to give a better deſcription of his Forceps than he has, and likewiſe an engraving of the two ſides, and particularly of the blades, inſtead of referring his readers to Mr. *Savigny* or Mr. *Carſberg*, inſtrument-makers in London, for a ſight of his Forceps, as made by them exactly, as the Doctor ſays, to his own directions, or rather to their directions.

tenths of an inch, as in Fig. 4 and 10, and at the point of the blade's bifurcation have joined them together with a hinge; by the contrivance of which, and by the handles of the fangs being bent and made to diverge off at the hinge, the two fangs may be kept ſo cloſe together, by the finger being placed between their handles, as to be in effect but one narrow blade in breadth the ſix tenths of an inch, and thus it can be eaſier, more readily, and conveniently introduced under the arch of the pubes than the blade either of the ſingle or double curved Forceps, as taking up leſs room, conſequently will more readily paſs up the ſpace between the oſſa pubes; and further, when the fangs are introduced by removing the finger that was placed between their handles, and then on preſſing their handles cloſe together, the two fangs will be immediately ſpread open, and cannot cloſe again, when the two ſides of the Forceps are locked together; for the projecting cheek of the groove for the locking part of the oppoſite blade keeps the double handle of the fangs perfectly ſecure, ſafe and firm, ſo that the two fangs will remain ſteadily fixed* and expanded.

Hence with theſe kinds of Forceps, viz. the ſingle curved, the narrow, or fanged blade, as adapted ſeverally to the particular caſes, the delivery of almoſt every variety of retarded labor may be very ſafely and effectually accompliſhed, without injury to the mother, or hurt or deſtruction to the child.

But to be a little more explicit with reſpect to the uſe of the above-mentioned kinds of Forceps.—Let it then be obſerved, that though Dr. *Oſborn* ſuppoſes the double

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[*] I am ſenſible that ſome practitioners will ſay, by the diviſion of one blade of the ſingle curved Forceps into fangs, that in introducing them within the projection of the pubes their ends (or as they may be termed points) will be more apt to wound, pinch, nay even pierce through the vagina, &c. or lacerate the child's head, than the more blunted ends of either the ſingle or double curved Forceps—granted. But ſuch will be the caſe with every kind of Forceps in the hands of the raſh and impetuous practitioner, who boldly attempts with force to introduce the blade againſt any obſtruction to it, inſtead of letting it paſs on freely, eaſily, readily, and without force, and immediately ſtopping and withdrawing it on meeting with any reſiſtance.

curved Forceps to be more effectual and ſafe than the ſingle curved Forceps in all caſes of retarded labors, as particularly when the face preſents itſelf forward with the chin towards the pubes, with the vertex of the head deſcending into the hollow of the ſacrum, or even when it has got no further than juſt under the projection formed by the upper part of the ſacrum and curvature of the lumbar vertebræ; and alſo, when the face preſents itſelf forwards, with one ear to the pubes and the other to the ſacrum, and reſting as it were on the ſpinous proceſſes of the iſchia, and cannot from its poſition proceed any further; or when the vertex of the head preſents with one ear to the ſacrum and the other to the pubes, and although the pelvis is duly formed, of its proper ſize and elliptical figure, yet from the largeneſs or length of the child's head it reſts on the ſpinous proceſſes of the iſchia, or perhaps higher up in the pelvis, and can proceed no further, nevertheleſs, in ſuch like caſes, I cannot but think that every practitioner, after impartially conſidering the ſtructure of

Dr. *Oſborn*'s double, or rather triple curved Forceps, and comparing it attentively with the ſhape of the child's head and mechaniſm of the female pelvis, and carefully examining the different circumſtances attendant on ſuch labors, will very candidly confeſs, that the double curved Forceps is not more ſafe, preferable and effectual, than the ſingle curved Forceps; nay, I rather believe, that they will decidedly determine that the double curved Forceps is not ſo effectual, ſafe, nor ſo well adapted for the delivery of women in ſuch caſes of retarded labor as the ſingle curved Forceps is; but yet it muſt be confeſſed, that in the hands of the expert and judicious practitioner, perhaps any kind of Forceps may be very ſafe in effecting the delivery; but, in the hands of the inexpert, unthinking and haſty practitioner, the double curved Forceps will certainly do much miſchief.

But, however, it ſometimes happens, even in the moſt natural preſentations of a common ſized head, that one blade of the ſingle curved Forceps, or the blade of any other Forceps heretofore invented, cannot be eaſily or readily introduced between the head * and pubes, nay not without ſome conſiderable force, and ſometimes cannot by any means be introduced, and this in ſome meaſure owing to a too great ſtraitneſs of the ſacrum obſtructing the child's head in its natural deſcent through the pelvis, but chiefly to a too forward projection of the pubes diſtorting the natural figure of the female pelvis, rendering it rather of a triangular figure, as in the male pelvis. Hence, by the too forward projection of the pubes, the ſpace between them is rendered too narrow to admit the breadth of the blade even of the ſingle curved Forceps, ſo that when the blade is introduced at the os externum, the end of it from its too great breadth cannot paſs up between the head and pubes, but will go directly againſt the head, and hence from this obſtruction of the head in ſuch caſes to the introduction of the Forceps' blade; the

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* In ſuch caſes ſome practitioners recommend introducing one blade of the Forceps firſt towards the ſacrum, and then to bring it round to the pubes; this is certainly dreadful practice, and more likely to injure the uterine parts than the careful and gradual introduction either of the blade divided into fangs as Fig. 4 and 10, or the narrow blade Fig. 3.

head has often been deemed too large to paſs any further, and conſequently has been, by the too haſty and raſh practitioner, unthinkingly and very precipitately opened, and the child deſtroyed, in order to facilitate the delivery of the woman.—Now all this may be avoided by the introduction of the contracted narrow blade Fig. 3, or the fangs of the divided blade Fig. 4 and 10 of the Forceps, as juſt mentioned, which, from their narrowneſs, can in ſuch caſes fall further in between the too cloſe and forward projection of the pubes, and conſequently may more eaſily, readily, and without hurting the woman or child, be introduced; and when introduced, the two fangs of the divided blade will immediately open, and when locked will become in action equal to the blade of any other Forceps; for it muſt be obſerved, that in extracting the head in the above caſe with the Forceps, the chief power and action is from that blade next the ſacrum, that next the pubes ſerving only as a ſtay or ſupport and director to the other; for as the head is brought, or rather drawn down, and deſcends in the pelvis, the action of the hindermoſt blade, or that next the ſacrum, forces and turns the vertex of the head towards the arch of the pubes, ſo that the face falling into the hollow of the ſacrum, the long ſhape of the child's head is turned into the lower and long part of the pelvis, from whence the head may be eaſily and readily delivered; hence, by rendering one blade of the ſingle curved Forceps ſo narrow as to be readily introduced between the pubes and the child's head in ſuch retarded labors, occaſioned in ſome meaſure by too great a ſtraitneſs of the ſacrum, as juſt mentioned, but chiefly by a too forward projection of the pubes, diſtorting the due ſize and natural elliptical form of the female pelvis, particularly towards the pubes, many advantages muſt ariſe, much trouble, difficulty and anxiety to the practitioner may be avoided, and, what is more particularly to be conſidered, the deſtruction * of the child may be often prevented,

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* Theſe advantages certainly will ſet aſide every fear as to the uſe of the narrow or fanged blade of the forceps wounding, pinching, or piercing through any internal part

vented, and that from the uſe and application of the ſingle curved Forceps with one blade divided into two fangs, as Fig. 4 and 10, or contracted into a ſingle narrow blade, as Fig. 3.

Such then, I think, ought to be the neceſſary forms or ſtructure of the different kinds of Forceps, that ſhould be applied in the different caſes of retarded labors for the ſafe and happy deliverance of the child without injury to the mother.

But further with reſpect to the uſe of the Forceps, it is neceſſary to obſerve, that in whatever kind of retarded labor the uſe of any kind of Forceps is required, particular care muſt be taken that, in extracting the child's head, the action of the handles of the Forceps be not directed out of the deſcending axis of the pelvis; for when that happens, it throws the natural diameter or ſhape of the child's head out of

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part of the woman, and particularly ſo, as every contrived method for delivery ſhould be firſt attempted before the practitioner ſhould dare to open the head, and thus to deſtroy the child.

that deſcending line*, and thus not only retards the labor, and renders the head more difficult to be extracted, but the blades of the Forceps immediately compreſſing on the ſides of the pelvis, whatever part is between them and the bones of the pelvis will be greatly contuſed; hence much miſchief will certainly enſue; therefore ſuch undue inclinations of the handles of the Forceps muſt be carefully avoided, and hence for the ſafe and eaſy extraction of the head, in every action of the Forceps, the deſcending line or axis through the pelvis muſt be particularly obſerved, ſo that the handles of the Forceps be not carried out of it, by which means the long ſhape of the head will be gradually and regularly drawn down, and turned into the long or tranſverſe diameter of the inferior or lower part of the pelvis. And further,

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* As by the injudicious and forcible working or motion of the handles from ſide to ſide in the extraction of the child's head, ſo generally recommended by authors, and ſo often practiſed in ſuch operations; for it muſt be obſerved, that whenever the handles of the Forceps in extracting the head are ſo uſed, that then each ſide of the Forceps acts alternately as a vectis or lever, and therefore the Forceps muſt then, in fact, be conſidered as a double vectis, and that whenever its handles are moved from ſide to ſide, each blade muſt become a vectis alternately, whoſe fulcrum, as relative to the woman, is not at the joint or locking part as is generally imagined, whatever it may be as to the child's head, but on the convex ſide of the blade which on ever ſo little inclination of the handles of the Forceps out of the deſcending line or axis of the pelvis will immediately preſs on the bones of the pelvis, and if the handles are moved forcibly out of their proper line, the fulcrum, which then falls on the convex ſide of the blade, to which ſide the handles are inclined, will greatly compreſs and contuſe the ſoft parts that may then ~~lay~~ lie between the blade and bones of the pelvis; hence much miſchief frequently ariſes from ſuch motions or working of the handles from ſide to ſide in the extraction of the child's head.—That the fulcrum of the Forceps is not at its joint or locking part is extremely evident, as there is no fixing the oppoſite

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poſite blade for it to become ſuch; for though the blades are each ſtrongly ſqueezed and firmly attached to the head by the operator firmly graſping and preſſing the handles, yet as the head is moveable from ſide to ſide, the fulcrum cannot fall on the joint as generally ſuppoſed, but alternately on the convex ſide of the blades as they are moved from ſide to ſide, the moment they preſs on the bones of the pelvis. How cautious then ought every practitioner to be in extracting the head, that he inclines not the handles of the Forceps out of the deſcending axis of the pelvis!

it ~~may~~ must be obſerved, that when the face or vertex of the head is brought ſo low as to point directly through the os externum, and the other parts of the head reſt on the perinæum, that then the blades of the Forceps ſhould be taken off* and removed, and the head left entirely to be expelled by the natural efforts of the woman's pains; by theſe means the perinæum will be naturally diſtended, and a laceration of it

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* In general it is directed, that the child's head ſhould be entirely extracted with the Forceps, in very weakly women where the pains are too ſlight and inſufficient to protrude the child, and where alſo the perinæum is in a lax, yielding ſtate, the labor may be ſo far finiſhed, and the head extracted ſlowly, gradually, and regularly; but when the perinæum is rather rigid and not very yielding, and the woman of a healthy robuſt conſtitution, and the pains ſtrong, it is much better to remove the Forceps as ſoon as the head begins to dilate the os externum, than to extract the head forcibly with the Forceps, for fear the perinæum ſhould be lacerated; and it will be more agreeable both to the woman and to the byſtanding women, when they perceive that you act with caution and deliberation, and not with force; and beſides, it is always then in our power to refix the Forceps inſtantaneouſly, and that with eaſe and facility, if any unforeſeen accident ſhould happen to ariſe, which I believe never will.

(which too commonly happens if the head is forcibly drawn out by the Forceps) will be prevented; for ſuch diſagreeable accidents to women are entirely owing to force, or to an inſufficiency of time being allowed for the texture of the perinæum and parts round it to relax, or to diſpoſe themſelves for a proper and neceſſary dilatation; therefore, if a proper time is not given, after the vertex or face is brought ſo low as to point directly through the os externum, for the fibrous texture of the perinæum, &c. to dilate and extend itſelf backwards, a laceration of it will certainly be the conſequence, if the head is forcibly and precipitately drawn through the os externum with the Forceps, as is often done by the haſty and impetuous practitioner.

As much miſchief then may be done by too haſty, bold, and imprudent practitioners, it will be neceſſary to remark, that in the uſe of the Forceps, the blades muſt be introduced ſlowly, readily and gradually, without force, that they be eaſily and evenly locked together, ſo that the oppoſite blades may exactly correſpond with each other; and when locked, the handles ſhould be only ſo compreſſed together, as for the blades to take ſuch a moderate firm hold of the head as juſt ſufficient to keep them from ſlipping off; for if they are cloſely and ſtrongly compreſſed together, the head will be lacerated, or ſo violently bruiſed and preſſed between the blades, as perhaps even to kill the child. And further to remark, that in extracting the head, it ſhould be performed with as little force as poſſible, not even if poſſible with more than merely holding down, or retaining the head in the poſition in which the preceding labor pains of the woman had placed* it; obſerving

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* Though ſome practitioners pretend to ſay that force is abſolutely neceſſary, and ſometimes ought to be ſo far exerted as even to lift the woman up from her bed with the Forceps when fixed on the child's head within her; *O horrible work!*—But yet let it be obſerved, that ſuch force is not neceſſary, for as the bones of an infant's head are not perfectly nor entirely oſſified nor connected together but by membranous ſubſtances forming the ſutures and fontinells of the head, ſo the head of an infant is thereby, through compreſſure, rendered capable of being changed in ſhape and diminiſhed in ſize, and thus may be ſo elongated and adapted to the cavity of the pelvis,

ſerving at the ſame time, as the head deſcends in the pelvis, that, in making the turn neceſſary for placing the long ſhape of the child's head into the long tranſverſe diameter of the lower part of the pelvis, the direction of the Forceps' handles be equally, ſlowly, gradually, and regularly inclined, and ſteadily kept in the deſcending axis of the parts, and that with as little force as poſſible, by which means every kind of injury to the mother will be avoided, and the head very readily and ſafely brought down ſo low as to have its crown reſt on the perinæum, and its vertex pointing out of the os externum; and now, as the head has paſſed by every reſiſting cauſe, there can be no further uſe for the Forceps; therefore it muſt be ever remembered, that, when the vertex of the head or face is

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vis, as to take its ſhape, and to paſs through it with very little force, provided the practitioner will give for it a proper time, and is not harſh or impetuous in extracting the head with the Forceps. In ſhort, whatever force is neceſſary, it ſhould be begun in the moſt ſlight and gentle manner, and not wantonly increaſed, or even exerted beyond what will gradually, regularly and almoſt imperceptibly, extract the head.

brought ſo low as to dilate and point out at the os externum, and the crown of the head to diſtend and reſt on the perinæum, the blades of the Forceps ſhould be taken off, and the remaining part of the labor, as before mentioned, ſhould be left entirely to nature, in order to prevent a laceration of the perinæum, a misfortune very diſagreeable to women, and therefore ought, by every means, attention and care, to be prevented, if poſſible.

Thus far I have thought it proper to ſpeak of the different forms of the Obſtetric Forceps, with cautions, remarks, &c. neceſſary to be obſerved as to the uſe and management of their particular application in certain caſes of retarded labors.

I AM next to proceed and make ſome reflections, remarks, &c. and give ſome cautions reſpecting the conduct and management of other kinds of labors, in which the aſſiſtance of the Forceps is not ſo materially nor ſo eſpecially neceſſary.

And firſt,

Of thoſe kinds of retarded labors in which the head cannot be extracted by the Forceps, but in order to ſave the woman's life, it is requiſite to come to the laſt reſource, that of opening the ſkull of the child's head, ſo that the head may be reduced in ſize ſufficient, with the aſſiſtance of the crotchet, or blunted hook, &c. to paſs through the pelvis, let whatever may be its figure, ſhape, or diſtortion.

It will therefore be neceſſary to ſay, in every caſe requiring the opening of the child's head, to reduce it to a ſize proper to paſs through the pelvis, and to be extracted with the crotchet or blunted hook, &c. that there is no operation in midwifery that requires ſo much care or greater deliberation; for though it may be ſaid, that ſuch caſes always proceed from the ſame cauſe, namely, that of the head being too large to paſs through the pelvis, nevertheleſs the head may be itſelf ſo large and hydrocephalous, as even not to paſs through a well-formed pelvis; and, on the contrary,

though ~~nay~~

though the head may be of a natural ſize, nay not ſo large as common, yet the pelvis may be ſo ſmall and diſtorted as not to admit it to paſs through. In the firſt caſe, merely by opening the head and evacuating its contents, the head may be ſo reduced in ſize as ſoon after to deſcend ſo far down in the pelvis as to be readily extracted with the blunted hook, or even with the Forceps, or perhaps even forced through the pelvis by the natural labor pains. But in a diſtorted pelvis the caſe is otherwiſe; there is more danger and difficulty, and that in proportion to its diſtortion: wherefore it is neceſſary to remark, that if the pelvis is not much diſtorted after opening the head, it may be perhaps ſo reduced, as after a little time to be protruded ſo low down in the pelvis, as to be readily extracted with the blunted hook or crotchet *, &c. But if the pelvis

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* To extract the head of a child after its ſkull has been opened and its contents evacuated, ſo as to reduce it in ſome degree to a ſize capable of being drawn through the pelvis, a variety of modes have been propoſed, and inſtruments invented and recommended, but thoſe

pelvis is ſo much diſtorted, that there is not two, or ſcarcely two inches and a quarter of an inch diſtance from the ſacrum to the

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thoſe called the blunted hook and crotchet, have been hitherto for this purpoſe the moſt eſteemed; nevertheleſs, even in the uſe of theſe, practitioners differ much in their opinions; but as it would be very abſurd and tedious in this place to endeavour to refute any particular opinion concerning them, I ſhall only ſay, reſpecting their uſe in ſuch caſes, what appears to be fact. If then the pelvis is not very narrow, and the head deſcended ſomewhat low in the pelvis, the blunted hook is preferable, and its end, if poſſible, ſhould be fixed over the jaw-bone, as affording the firmeſt hold, and not being apt to tear out; conſequently no injury will happen to the woman; but then the operator muſt conſtantly obſerve, in extracting the head therewith, to uſe as little force as poſſible, and to keep the handle in the deſcending axis of the pelvis, inſtead of working it to and fro, and thus avoid hurting the internal parts of the vagina, &c. But if the pelvis is narrow, and the head not far advanced into it, the crotchet may then be preferable, and ſhould always be introduced through the opening made in the ſkull, and its end carried into the foramen magnum, and there firmly fixed; and then taking every precaution in extracting the head, that the crotchet does not tear out and hurt the woman; but if the end of the crotchet cannot be readily fixed in the foramen magnum, it ſhould not be fixed any where elſe, for probably it will tear out and hurt the woman, unleſs you guard her very the pubes, much difficulty immediately ariſes therefrom ; ſo that after opening the head, its extraction muſt be deferred for

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very carefully with your other hand, and ſo perhaps receive the injury yourſelf.

But however, to avoid in a great meaſure any accident from the uſe of the blunted hook or crotchet, and indeed in ſeveral caſes to ſuperſede the uſe of any ſuch ſort of hooked inſtruments for extracting the head after it is opened, it has ſuggeſted to me to reflect backwards one blade of the ſingle curved Forceps, as in Fig. 11, 12, and 13, the outward blade of which is always to be the narrow blade of the Forceps Fig. 3, which, as uſual, is to be introduced into the pelvis over the outſide of the head, but the reflected blade is to be introduced within the ſkull, through the opening in it, and then on locking the two blades together, they will ſo firmly include and hold the integuments and bones of the ſkull as to enable the operator to extract the head equally as efficacious as with the blunted hook or crotchet; and therefore, as the reflected blade of the Forceps in its ſtructure is ſo much leſs liable materially to injure the woman than the end of the blunted hook or crotchet is, if peradventure either of them ſhould very ſuddenly and unexpectedly tear out, the reflected blade of the Forceps, as being thus preferable, ought, in every caſe of this kind, to be applied, if poſſible. Hence in caſes requiring the head of the child to be opened for the delivery of the mother, after that operation has been performed, it will be proper firſt to try to extract the head with the ſingle curved Forceps Fig. 1,

and

ſome time, perhaps one or two days or even longer, until ſome degree of putrefaction* comes on, when the bones of the head will readily ſeparate from their integuments, and will perhaps ſo far protrude, that the greater part of them may be readily extracted with the fingers; and then to extract the remaining parts the blunted hook may be fixed over the jaw-bone, or the crotchet to the baſis of the ſkull, after

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and, if that is impracticable, then to try the reflected blade of the Forceps, and if that has not the effect, then to have recourſe to the blunted hook or crotchet, always remembering not to introduce or fix either of theſe inſtruments in any uncertain manner, it being much better to leave the whole to nature and to the putrefaction of the head, and to get it away bone after bone, as the bones of the ſkull will ſlip from their integuments, and then the other parts of the child will ſoon follow.

* In a caſe of this kind I have known ten days to paſs over, before the child, though in a very high degree of putrefaction, could be extracted, and yet the woman, though entirely ſenſeleſs with cold clammy ſweats, great difficulty of breathing, and pulſe ſo weak as ſcarcely to be felt, for the ſix laſt days, contrary to every expectation recovered, ſo as to be at the end of her month as well as moſt women uſually are; ſhe has had no child ſince, as, on account of her dwarfiſhneſs, her huſband and ſhe very ſoon after by conſent parted.

which the other remains of the child, as a ſoft yielding ſubſtance, will readily follow. Hence, great attention, care and caution, in ſuch caſes, are abſolutely neceſſary, and poſitively required; and in ſhort, let whatſoever be the figure or form of the pelvis, or ſize or ſhape of the head, it muſt ever be remembered, that after the operation of opening the head, and after a proper time waiting for its deſcending into the pelvis, that, in extracting it with the Forceps, blunted hook or crotchet, whether applied externally on the head or within the ſkull, it ſhould be performed in a ſlow, regular and moderate manner, with as little force as poſſible; and that, when the child's body and ſhoulders are brought ſo low as to occaſion a diſtention of the perinæum, &c. it ſhould then be for ſome time left to nature, until a proper dilatation of the perinæum can take place; and when that will gradually yield and extend, then, if the natural labour pains are not ſufficient to ~~exclude~~ expel the child, it may be ſlowly extracted, after which the ſeparation of the placenta muſt be left to nature, and to be extracted as in a natural labor.

And now ſecondly,

It will be neceſſary to remark, that in conducting preternatural labors, the hand of the operator ſhould be introduced ſlowly, gradually, and with as little force as poſſible; and that when a foot or the feet of the child * are found and graſped with the operator's

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* Whenever a child is to be extracted by the feet, ſome authors particularly adviſe, that the operator ſhould always with his hand ſeek for both feet of the child, and therewith extract it; but this is not always neceſſary, neither can it always be done without much danger, difficulty and pain, therefore much is to be left to the operator's judgment: if the pelvis is of a due ſize and form, it is not material whether the child is extracted by both feet or by one; ſo if both feet are not to be found readily, if the pelvis is large, one foot will be ſufficient, and the child may therewith be eaſily extracted: but if the pelvis is not very capacious, nay rather narrow, it may then be more prudent for the operator, if he can readily find the child's feet, to graſp them both and by them extract the child; ever remembering, that after having graſped a foot or the feet, if high up towards the fundus uteri, never to bring them backwards, but always to carry them forwards down to the belly of the child, by which

operator's hand, he ſhould together with the child's foot or feet withdraw it in like manner; thus the body of the child will turn as gradually, and will be eaſily extracted; but remember, that, when the child is ſo far delivered as the buttocks to reſt on the perinæum diſtending it outwards, then the operator ſhould make a halt, and allow time for the texture of the perinæum &c. to yield, and ſo extend itſelf, that in the further extraction of the child's body * and head it may ſafely be delivered

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which means the child will readily turn without injury to it, and may be perhaps delivered alive; but if the foot is imprudently reflected backwards, the child will not ſo eaſily turn, and perhaps either its thigh-bone will be broke or diſlocated, or the vertebræ injured, and the woman much hurt.

* In extracting children by the feet, it is always neceſſary for the operator to obſerve, that, when the buttocks of the child are protruding through the os externum, in extracting the body, he ſhould incline it ſo, that the belly of the child ſhould turn towards the back part of the mother, by which means the breadth of the ſhoulders will turn into the long tranſverſe diameter at the brim of the pelvis, and thus be eaſier brought down; and further, it is to be obſerved, by this inclination of the child's belly towards the back part of the mother, that

delivered without hurting or lacerating the perinæum: and beſides, thus preventing by this halt any laceration of the perinæum, we alſo obtain a proper time for the natural ſeparation of the placenta as in a natural labor.

Again, thirdly,

It will be neceſſary to obſerve with reſpect to the delivery in flooding caſes, that the management of them requires the greateſt degree of attention, care, caution and deliberation.

Although, in the earlier months of uterogeſtation, if an uterine hæmorrhage ſhould happen, nothing more can be done than to enjoin, in the ſtricteſt manner, reſt, an horizontal ſupine poſture of body, with ſlight reſtringents, cool air, &c. and after a few days, though ſometimes not for a few weeks, as a blighted fruit, the abortive em-

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that as the body and arms of the child are extracting, the face of the child turns alſo towards the back, and then the length of the head falls naturally into the ſame diameters of the pelvis, and thus turning with the face towards the ſacrum, it is readily and eaſily extracted.

bryo, &c. will be diſcharged; and then, by the woman continuing in bed and at reſt, with ſoft thin gruel, bread food, &c, for ſeveral days, until all appearances of diſcharge have ſtopt, all will be well.

But it is in the later months of utero-geſtation that the greateſt danger occurs, requiring the utmoſt circumſpection how to manage them; if then, near to the time of parturition, a ſhew of blood, as it is called, ſhould appear, the very firſt injunction is reſt, and by keeping ſtrictly a ſupine horizontal poſition of body, quietneſs of mind, with thin ſoft gruel, light bread diet, &c. with moderate reſtringents, cool or rather cold air, and a total forbearance from any attempts towards delivery, perhaps all in a little time may be well again. But if after the diſcharge has ceaſed for ſome hours or days, it ſhould again appear, the ſame mode of treatment muſt be continued; for generally from the blood coagulating, and thus ſtopping up the orifices of the bleeding veſſels, it will again ceaſe, perhaps, for ſome hours or days, or perhaps remain very trifling for ſeveral days, after which it may again recur more copiouſly; and indeed, it cannot be altogether expected to ſtop, as it generally proceeds from a ſeparation of ſome part of the placenta lying over the lower, though now the expanding part of the uterus; hence a ſeparation of their veſſels, and thence an hæmorrhage; therefore reſt, ſlight reſtringents, cool or cold air, with ſoft food, &c. are as yet the only remedies; the practitioner indeed may touch his patient, but not with a view or thought of promoting or effecting a delivery, but to know the diſpoſition of the os uteri; for nature, if poſſible, muſt be the only operator; the practitioner muſt be her ſervant and attend; he ſhould, therefore, watch daily the dilatation of the os uteri, how far it has expanded itſelf, how thin grown, ſoft and yielding, and how great a portion of the placenta lies contiguous or over it; and he ſhould carefully obſerve whether any ſlight pains at times occur, which ſhew that the fundus uteri is diſpoſed to contraction, or has begun to contract; for without a conſtant attention being properly paid to theſe ſymptoms, the practitioner will find himſelf very ſoon at his *ne plus ultra*; for, though the diſcharge may be often very profuſe, ſo that the woman may be as often faint, &c. nevertheleſs the practitioner muſt not be too haſty, he muſt have patience; the delivery muſt ſtill be ſuſpended, until ſome more ſufficient pains come on, as they are of ſuch conſequence to the woman's life; for without ſome motion or contraction in the moving fibres of the uterus, which is known only by pain in the region of the uterus, however ſlightly occurring, the delivery will terminate in immediate death.

Therefore, if the bold, haſty, raſh, careleſs, impatient, impetuous, imprudent and unthinking practitioner *, ſhould forcibly attempt to deliver, before the moving fibres of the uterus are capable of contracting, as ſoon as the child &c. is thus haſtily extracted, the uterus will be left as an empty flaccid bag, its blood veſſels will remain open, and a violent profuſe hæmorrhage or flooding will immediately commence, and the woman in conſequence will almoſt inſtantly faint, and expire under his hands *. *Woe to ſuch practitioners! Horror to their reflecting minds!*—Whereas, on the contrary, no fatal misfortune to the woman would enſue, nor diſquieting reflections invade the practitioner's mind, if he had but allowed patience and attention to have been his guides, and eſpecially in thoſe caſes of uterine hæmorrhages happening in the later months of uterogeſtation, and ariſing particularly from a ſmall portion or lobe of the placenta lying cloſe to, or over the os uteri; for when that orifice begins to expand and dilate, as towards the laſt month of uterogeſtation it always doth, then, in conſequence of that dilatation, a ſeparation of certain veſſels of the placenta from the uterus begins to take place, as is manifeſt firſt by a ſlight ſhew of blood, which after a little time ceaſes, then on any ſlight motion of the woman again appears; then ceaſes, and again returns, or perhaps continues thus trifling for ſeveral days; then again appears, ſo as to alarm the woman and her friends.

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* Such practitioners I have known.

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* And ſuch accidents have happened under their hands.

The practitioner muſt now be upon his guard, he muſt ſooth the woman by ſpeaking in a mild gentle manner to her, by telling her, that all will ſoon be well, but that much depends on keeping herſelf at reſt, quiet in mind, &c. and ſlight reſtringents, as ~~tinctura~~ Infuſum roſæ, or even a little cold water very ſlightly acidulated with vinegar, may now and then be given. To her friends he may hold out, that there may be ſome danger, nay much danger, yet he hopes all will terminate well; but let him ever remember, that much depends on his own conduct; he muſt not be impatient; he muſt watch the woman very attentively and carefully, perhaps for ſome days, even many days*, for a contraction of the moving

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* I have had ſeveral ſuch hæmorrhages from ſuch a cauſe continue more or leſs for two or three weeks, nay even longer, and yet do well; labor pains at laſt coming on, the hæmorrhage has ſtopt, and the child expelled naturally; and when the placenta has been expelled, I could then ſee how great a portion had been ſeparated by its contain-

ing fibres of the uterus taking place, which he may know by ſlight and alternate pains coming on the woman, alſo by her uneaſy motions of body, by the tenſeneſs, in the time of pain, of the membranes, which may perhaps now be felt through the opening of the os uteri; if ſo, he may now be well aſſured, that all may do well; but ſtill he muſt give time, for if he does not, he may as yet loſe the woman; for though the diſcharge is perhaps ſometimes profuſe, nevertheleſs, as the pains increaſe in force, thoſe motions or contractions of the uterus may ſo cloſe up the bleeding veſſels as in ſome degree to ſuppreſs the flooding; and when the os uteri is ſufficiently dilated, he may break the membranes; or if the placenta lies entirely over the os uteri, and thus preſents itſelf, he may pierce through it, in order not merely to diſcharge the waters, but to give more eaſe to the contracting fibres of the uterus; and as the waters

containing much coagulated blood, and by its being of a more dark livid colour than the other parts of the placenta.

diſcharge, the tonic ſtate and contraction of the uterus will more and more take place, and thus very much ſuppreſs the hæmorrhage or flooding; but obſerve that when the practitioner has broken the membranes, or pierced thro' the placenta, as the labor pains, or the natural alternate motions and contractions of the uterus, will undoubtedly very ſoon or immediately increaſe in their force and bearing down as the waters are diſcharged; if then the head preſents naturally, the reſt of the labor muſt be left to nature, and conducted as a natural labour *; but if the head

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* In flooding caſes, at the latter end of uterogeſtation, at the very onſet of, or during labor, it is generally adviſed not to wait for the natural efforts of the pains, but immediately on breaking the membranes, &c. to deliver by the feet, whatever may be the preſentation; but I have conducted very ſafely many caſes of this kind, where the head preſented, entirely by truſting to the natural labor pains; and to this I have been induced, firſt, to avoid certain accidents that may occur in turning a child and delivering it haſtily by the feet:—but, ſecondly and chiefly, from conſidering the ſtate of the circulation between the mother and child; from which it appears, that the diſcharge of blood in ſuch uterine hæmorrhages proceeds more from the veſſels of the detached portion of the placenta, than from the denuded veſſels of the uterus; for

head ſhould be ſtopt in the pelvis by any particular diſtortion of it, or by the largeneſs of the child's head, or by any other unforeſeen

for though when the placenta lies on part of, or over the os uteri, as that orifice dilates, it ſeparates a certain part of the cervix uteri from a certain portion of the placenta; nevertheleſs the blood cannot proceed ſo freely from the veſſels of the cervix uteri as from the placenta, although granting, as the os uteri dilates, that the veſſels of the cervix uteri are not contracted; yet it muſt be allowed, that they are then ſo far extenuated as to be rendered in their diameters much ſmaller than they were before, and that ſome are drawn ſo fine in their diameters as even not to admit of red blood to paſs through them, conſequently in this their effect, no great degree of flooding can proceed from them, but on the contrary, from the veſſels of the ſeparated portion of the placenta the blood may proceed freely, but yet not ſo much, nor ſo readily from the venal part of it as from the arterial, though granting that the veins of the detached portion of the placenta anaſtomoſe with thoſe veins of the placenta not yet ſeparated from the uterus; yet as ſuch detached veins, immediately on their ſeparation from the uterus, muſt loſe their power and become inactive, and as the blood to occaſion an hæmorrhage muſt paſs through them in a retrograde courſe, and contrary to their ſhape and figure, &c. it conſequently will ſoon ſtagnate and coagulate therein, ſo as to ſtop them up, and thus no great diſcharge can continue long to paſs through them ſo as to be deemed a flooding: but it is from the arterial veſſels

foreſeen cauſe, then the child muſt be delivered as in retarded labors. But if the head ſhould not preſent when the mem-
branes,

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veſſels of the ſeparated part of the placenta, that the greateſt ſhare of the hæmorrhage proceeds, and conſiſts of that blood which would have been returned from the child to the mother, if there had not been a ſeparation of a certain portion of the placenta from the uterus; for as the blood is taken up from the uterus into the placenta by the venal ramifications of the vein of the funis, and along which it paſſes and proceeds into the body of the child, and then almoſt immediately paſſes on and circulates through the heart, &c. it is from thence almoſt as immediately returned through the aorta and iliacs into the arteries of the funis, and thence into their branches in the body or ſubſtance of the placenta, and in this courſe the blood can paſs readily, ſo that from the detached portion of the placenta the ſeparated arteries may pour out their blood ſo very profuſely, as to occaſion ſuch a diſcharge as to be deemed a flooding. Hence though the loſs of blood in this manner may in ſome time equally affect the mother, as if it had proceeded entirely from the denuded veſſels of the uterus, yet it is not ſo very immediately quick as to require an immediate delivery at its firſt appearance, when the os uteri near to or at the onſet of labor firſt begins to dilate; and hence as ſuch diſcharges of blood from the uterine parts do not appear to me to proceed ſo much or ſo very immediately from the mother as from the child, nor to be ſo very immediately dangerous to the mother as ſome have imagined, ſo as to re-
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branes, &c. are broken, and ſome other part is felt, the child muſt be delivered by the feet, as in preternatural caſes; taking

care,

quire an immediate and forcible delivery, I have, therefore, from theſe conſiderations, truſted ſuch labors attended with a diſcharge of blood owing to a partial ſeparation of the placenta, and particularly if the head preſented, as much as poſſible I could to nature, and have as often not been diſappointed in my expectations. But granting the flow of blood to be chiefly diſcharged from the arteries of the detached portion of the placenta, it may again be ſaid that immediate delivery is alſo abſolutely neceſſary on the child's account, as that may ſoon periſh from the immediate loſs of blood; but not comparing the loſs of the child's life to the importance of the mother's life, it is evident that this will not be the caſe, as the child is conſtantly ſupported with blood from the mother ſo as to compenſate for the loſs of blood that is diſcharged by the detached arteries of the placenta, except when more than the major part of the placenta is ſeparated, and even then the child will not ſo immediately expire as to require for its preſervation an immediate and forcible delivery; for when the major part of the placenta is ſeparated from the uterus, the hæmorrhage in proportion thereunto rather ceaſes, and beſides the os uteri is then ſo much dilated, and the head deſcended ſo far down in the pelvis, as to ſhow that the labor is ſo far advanced, that the expulſion of the child by the natural pains of the woman will be effected before its expiration can take place; and again, as it muſt be allowed that the child has, even though the placenta is totally ſepa-

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care, whatever may be the mode of delivery in theſe caſes, that it is performed ſlowly, gradually and regularly, with as little force

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rated from the uterus, a vis vitæ, or a circulation of its own ſufficient to ſupport itſelf for ſome little time, ſo that provided there is no particular obſtruction to its expulſion, or a preternatural preſentation, a forcible delivery is not neceſſary; but if there is a peculiar obſtruction, or a preternatural preſentation, then artificial aſſiſtance is certainly very neceſſary, but not otherwiſe. Let thoſe then, who adviſe immediate and forcible delivery in uterine hæmorrhage happening in the laſt months of uterogeſtation, at the onſet of parturition, or during labor, conſider well theſe reflections, and then I am perſuaded that they will alter their opinion, and confeſs that immediate delivery at the onſet of, or even during labor, is not ſo very immediately neceſſary as they have adviſed, and ſo very poſitively recommended; for there can be no ſhow, or diſcharge of blood, or flooding, without a ſeparation of ſome part of the placenta from the uterus; ſo in whatever part of the uterus the placenta is connected, whether on the os uteri, or near to the cervix, or towards or at the fundus uteri, ſtill the ſame effect will take place as to the hæmorrhage, which will in every caſe proceed more immediately from the placenta and child than from the uterine veſſels of the mother; and this will appear very evident to any practitioner who will obſerve in thoſe caſes of retarded or preternatural labors where there are previous to its birth evident ſigns of the child being dead, as when from the funis umbilicalis falling through the os uteri down before the preſenting part force as poſſible, and with the greateſt cautions.

I am

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part of the child into the cavity of the vagina ſo as to be touched, and even ſometimes to protrude ſo far through the os externum as to be ſeen, and then from not perceiving any pulſation in its arteries, from its feeling cold, and from its appearing of a greeniſh brown colour, it is evident that there is a total ceſſation of the circulation between the mother and child, and that the child is dead, and further, that it is verging to a ſtate of putrefaction, and, in conſequence thereof, that there is an entire ſeparation of the placenta from the uterus; nevertheleſs under all theſe circumſtances no profuſe hæmorrhage or flooding is found to take place, although the child is ſtill within the uterus, and keeping its ſides expanded; for it is to be obſerved, that when by any morbid cauſe either from the mother or from within itſelf the child loſes its life before its birth, that then, as its circulation has ceaſed, no hæmorrhage or flooding can enſue through the child from the veſſels of the placenta, neither can it from the veſſels of the uterus, for as the putrefaction of the child and placenta comes on, ſo the placenta in conſequence thereof muſt ſeparate from its attachment to the uterus, the placenta now being an offenſive dead ſubſtance, the uterine veſſels will withdraw and contract themſelves therefrom, and entirely caſt it off, and that without any enſuing hæmorrhage or flooding, the veſſels of the uterus now being in a contractile ſtate, as is very evident in ſuch caſes from the placenta ſo immediately following the expulſion of the child, and more particu-

I am now, fourthly,

To obſerve with reſpect to convulſions happening in labor, that they are the moſt alarming

larly in thoſe caſes where the fœtus included and wrapt up within the membranes unruptured is entirely and wholly expelled altogether from the uterus, as often is ſeen in miſcarriages even in the later months of utero-geſtation; this certainly is a poſitive proof that in partial ſeparations of the placenta from the uterus the hæmorrhage or flooding proceeds more immediately through the child from the detached veſſels of the placenta than from the uterine veſſels of the mother, conſequently is not ſo very immediately dangerous to the mother as to require ſo very immediate and forcible a delivery as has been ſo generally ſuppoſed, and ſo very injudiciouſly recommended in order to ſave the woman's life, but which I am certain on the contrary has deſtroyed numbers, for whenever there is any hæmorrhage or flooding proceeding from the uterine veſſels, the uterine ſyſtem muſt be in an atonic ſtate, ought then forcible delivery to take place in ſuch a ſtate? Certainly no; though it is ſuppoſed by practitioners that ſuch a proceeding will ſo irritate the uterus as to recover its tonic ſtate, and thus contract the bleeding veſſels, and ſtop the hæmorrhage; but this is a very dangerous, uncertain and random practice, and I believe inſtant death to many. Hence may readily be perceived the reaſon why reſtringents are in general ſo inefficacious in ſuch uterine hæmorrhages; perhaps ſtopping up the vagina with ſoft rags wetted with cold water will prove the beſt and moſt effectual reſtringent;

alarming accident that can poſſibly occur, as they evidently ſhow that the nervous ſyſtem is in a very high degree of excitement, and that the habit or diſpoſition of the woman is in an exceſſive ſtate of mobility and irritability.

As convulſions generally come on very unexpectedly even in the moſt natural labor, the practitioner ought to be very circumſpect, conſiderate and attentive; and firſt he ſhould endeavour to aſcertain whether the convulſions are truly epileptic or hyſteric, as for their removal ſome difference in their treatment is neceſſary; for as the latter are not by far ſo dangerous as the former out of which very few recover, ſo our prognoſtics to the woman's friends muſt be regulated.

To diſtinguiſh of what kind the convulſions are, I ſhould be inclined to ſuppoſe, even though there was a continued loſs of ſenſe, that they were of the hyſteric kind,

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reſtringent; nay the only certain one that can in ſuch caſes be uſed until the expulſive pains of labor come on, and theſe forcibly taking place expel the fœtus &c. And ~~thus~~ then happily the hæmorrhage will ceaſe~~s~~.

by the frequent working of the eye-lids, by the almoſt conſtant motion of the jaws, by the full globular ſwelling and tightneſs of the throat threatening ſtrangulation, by the frequent alternate riſings of the thorax, by the deep ſighings or rather ſobbings, the toſſing and beating of the arms, and particularly if ſlight remiſſions and renewals of thoſe ſymptoms occur; but if there are ſmall intervals of ſenſe, or remiſſions of the moſt violent ſymptoms, the convulſions may then be deemed truly hyſterical, and as they frequently ceaſe before, or generally ſoon after the labor is over, the woman may perhaps ſafely recover.

But on the contrary, I would rather ſuppoſe that the convulſions were of the epileptic kind, if the eye-lids rather remained ſhut, and continued motionleſs, with the eyes turned up ſo far under the upper lids as almoſt to hide the cornea, if the muſcles of the face are ſo affected as to diſtort and draw the face more to one ſide than the other, with frothy matter foaming from the mouth, the jaws as it were fixed, the tongue ſwelled and ſeemingly too large for the mouth, great difficulty in breathing, ſtertor, inſenſibility, &c. and laſtly, from not perceiving any kind of remiſſion of any one ſymptom; hence much danger may juſtly be apprehended and predicted, few recovering, and indeed in ſome caſes it is greatly to be ſuſpected that apoplexy terminates the whole affair.

Whatever may be the cauſe of convulſions at the onſet of labor, whether owing to ſo great a mobility of habit, that, when the firſt motion in the uterine ſyſtem is given for labour, it is communicated through conſent to every muſcular fibre of the body, ſo as to excite or throw it into convulſions;—or whether, from the gradual dilatation or expanſion of the uterus during geſtation, there is at the period of labor a loſs of tone in the uterine ſyſtem from exceſſive diſtenſion, ſo that to remove this atony and to recover a due tone and vigor in the moving fibres of the uterus, nature rouſes her utmoſt efforts, and in the general commotion convulſions take place; or whether convulſions, happening at the onſet of or during labor, are owing to any other cauſe, I cannot ſay.

But I believe, that, for the moſt part, their approach may in ſome meaſure be foreſeen, and their attack ſuſpected, and this particularly if the woman complains of pain, or frequent giddineſs and ſwimmings in her head, and eſpecially if the pain increaſes ſo as often to be violently lancinating, or if ſhe complains of dimneſs of ſight, or of ſeeing very indiſtinctly, with a frequent wavering miſt coming before her eyes, or if ſhe has ſudden and violent rigors following her labor pains, with a fluſhed bloated face, often turning a little blackiſh; and alſo if ſhe has a kind of ſpaſmodic ſtricture acroſs the thorax occaſioning a very great ſhortneſs and difficulty in breathing; thus ſome one or more of theſe ſymptoms may proceed, increaſing more and more violently, until ſuddenly there comes on a total abolition of ſenſe, with ſtrong convulſive motions in every part of the body.

With reſpect to the management requiſite in ſuch dreadful ſituations, as the convulſions muſt be conſidered as of the acute kind, dependent upon exceſſive irritability and mobility of the nervous ſyſtem, the treatment muſt chiefly turn upon quieting the nervous ſyſtem, and obviating the effects of its convulſive exertions; hence the means to be adapted for theſe purpoſes ſhould be—If the convulſions are of the hyſteric kind, firſt to give the woman a free admiſſion of cool air, next to empty her bowels with ſome moderate purgative clyſter, and then try to allay the convulſive emotions with antiſpaſmodics, as tinct. caſtor. ℥i. ſpt. æther. vitriol. comp. gtt. xxx. tinct. opii gtt. xv. in a little aqua pura, and which may be repeated occaſionally until the hyſteria ceaſes, which commonly happens before the labour is over; and I have known this medicine of great ſervice in labor, where a kind of hyſteric ſtricture coming acroſs the thorax has occaſioned a very oppreſſive breathing, greatly diſtreſſing to the woman, particularly in time of labor pain.—But if the convulſions are of the epileptic kind, we muſt not only admit of cool air, but even ſprinkle her frequently with cold water; and as there is more or leſs of an inflammatory diatheſis and plethoric habit merely from contraction of veſſels, ſome blood, in proportion thereunto, ſhould immediately be taken away.— Leeches to the temples, if we were certain that the bleeding after their falling off would be profuſe, would have very good effect; and particularly ſo, if there were preſent any approaching ſymptoms to apoplexy, as ſometimes is the caſe.—Cupping, with ſcarifications on the head, would alſo be very ſerviceable; but as the evacuation by theſe means is generally ſlow and inſufficient, we ſhould always have recourſe to bleeding from the arm or jugular vein, by which means we may not only prevent a rupture of the veſſels in the head, but alſo remove a dangerous ſuffocation of the lungs; and further, to aſſiſt theſe means, the bowels ſhould be emptied by a briſk purgative ſaline glyſter; after which, to remove the general inflammatory ſpaſmodic affection of the epileptic convulſions, the ſedative antiphlogiſtics with antiſpaſmodics may be given, as vin. antimon. tartar. gtt. xx.— lx. tinct. opii gtt. xx. with ſpt. lavend.

comp. g^{tt}. x. in a little aquà pura, and the doſes ſhould be repeated as the urgency of the ſymptoms ſeem to require, until ſome nauſeating rather than an emetic effect of the medicine takes place, or the convulſions ceaſe; but, for the moſt part, all our aſſiſtance proves ineffectual, for generally the woman remains inſenſible, and dies juſt before or ſoon after her delivery.

Such then is the treatment from medicine in convulſions occurring at the onſet of labor; but with reſpect to the delivery in ſuch caſes, much is to be left to nature: the practitioner muſt be very careful how he excites pain by any unneceſſary aſſiſtance to promote delivery, leſt he thereby increaſes the convulſive exertions: he may indeed at the invaſion of the convulſions touch the woman, but with a view only to know the ſtate of the os uteri, how rigid, ſoft, or how far diſpoſed to dilate, but no particular aſſiſtance* is requiſite until the os

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* Immediate delivery is generally recommended in convulſions at the onſet of or during labor, but I doubt much of its propriety; at the onſet of labor it cannot be performed

Thus much for convulſions during labor.

It muſt now, fifthly,

Be obſerved with reſpect to the common or uſual modes of managing natural labors, as deſiring the woman to bear down and force with her pains; giving her warm ſtimulating liquors to increaſe the frequency and ſtrength of them, and likewiſe for the practitioner to pretend to aſſiſt, as it is called, with attempts to dilate the uterine parts, and alſo when the child is paſſing through the os externum to extricate it quickly and forcibly, and after the child is born, to attempt as precipitately, immediately, and with ſome force, to extract the placenta, are, I ſay, modes, though too frequently uſed by impatient and unthinking practitioners, exceſſively wrong, abſurd, and productive of the greateſt miſchief, nay, of every misfortune that can happen to a lying-in woman; whereas if the labor was entirely left to nature, nay rather retarded, all would terminate well.

Hence let me ſay, that a woman, at the

onſet of her labor, ſhould be left entirely to herſelf, to move where ſhe pleaſes, but ſhould keep herſelf cool; ſhe ſhould be ſpoke to in a mild ſoothing, though cheerful manner, and ſhe ſhould be particularly deſired not to uſe any effort in forcing her pains in order to accelerate her labor, for her pains are now the natural and neceſſary pains dilating the os uteri, &c. and were ſhe to uſe any forcing or bearing down with them, the uterine parts would not ſo readily dilate, but, on the contrary, the natural courſe of her labour would be much perverted and prolonged; all that the woman has now to do, is to keep herſelf extremely quiet, to take very little food only occaſionally, when thirſty a ſpoonful or two of thin ſoft gruel, leſt it ſhould excite ſickneſs *; and ſhe ſhould commit herſelf entirely

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* As the involuntary actions of vomiting agitate and affect every part of the body, ſo more particularly during labor ſuch emotions always produce ſudden and involuntary forcings of the uterus, and excite the woman to bear down violently, greatly diſtreſſing, painful, and often injurious to herſelf; therefore, if ſickneſs ſhould accompany

tirely to the moderate and natural efforts of nature, and not to be anxious about the return of pain, or the tedioufneſs of her labor; for in due time the uterine parts will expand and dilate, ſo that the child, without her forcing or bearing down, or any other way ſtriving or ſtraining herſelf, will gradually with very little pain ~~more eaſe,~~ and with the utmoſt ſafety to herſelf, be delivered.

Hence it is evident, that the practitioner at the onſet of labor ſhould attempt nothing; and ſo far from being ſolicitous for the delivery, that he ſhould avoid touching the woman; and he ſhould wait patiently

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pany labor, it ſhould be ſuppreſſed, if poſſible, by giving her a little magneſia alba or creta prepared, with a few drops of tinct. opii, or ſpt. æther. vitriol comp. in a ſpoonful of aqua pura, and ſhe herſelf ſhould be cautious in her eating and drinking, ſo as not to load or offend the ſtomach; a few ſpoonfuls occaſionally at a time of any thin ſoft gruel, will be ſufficient to ſupport her through labor, and thus ſhe will avoid much fatigue, and the conſequences of violent and involuntary ſtrainings, forcing and bearing down of the uterus, and every injury that can happen from ſuch emotions of her ſtomach and body. And hence I will ſay, contrary to the adage of old women, that a ſick labor is not a ſafe nor the beſt labor.

until by the tone of her voice, by the motion of her body, and by the frequency and continuance of the returning pains, it is evident, that her delivery is drawing near; he then may touch her in order to know the ſtate of the uterine parts, how open they are expanded, how far the child is advanced, and how ſituated. If then every thing is found to be natural, even though the labor may be far advanced, it muſt be left to go on by the natural efforts of the labor pains; for the practitioner muſt be very cautious in touching, leſt he breaks the membranes too ſoon*; and he muſt not even pretend to lend any aſſiſtance, or to uſe any force, or attempt to dilate the parts, for the greateſt ſecret in midwifery is to know when artificial aſſiſtance, however gentle, is not neceſſary, but will do hurt; all then, that the practitioner has now to do, is only to wait patiently, not to touch the woman, but to exhort her to be as quiet as poſſible, and not even to bear down, ſtrain or force herſelf, or even to uſe any particular efforts with her natural labor pains with a view to forward her delivery; for ſo far from being of ſervice to her will ſuch unneceſſary exertions of her pains be, that they will rather pervert her delivery, and occaſion it to be much more excruciating and diſtreſſing to herſelf; nay, it will prolong it, as ſuch exertions will greatly fatigue her mind and body, and will render the next returning pains irregular, ſo that the natural dilatation of the uterine parts will not gradually go on, nor properly take place; for nature knows beſt how and when to unravel and unfold the fibrous ſtructure of the os uteri, vagina, perinæum, &c. ſo as to diſpoſe them for ſuch a proper dilatation and expanſion as to give an exit for the child; therefore if labor is hurried in the dilatation &c. of theſe parts, numbers of fibres muſt be greatly injured, and perhaps ruptured, ſo that they cannot recover their proper places after the delivery; hence, from ſuch loſs of tone, &c. many diſeaſes and complaints to females ariſe, as procidentia vel prolapſus uteri, vaginæ, &c. conſequently every labor, that is, where the head preſents naturally, ſhould be left as much as poſſible to nature, even though it ſhould continue lingering &c. for ſeveral days, and then no doubt but all will terminate well, and the woman ſoon recover.

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* That is, not before the os uteri is dilated as large as, or almoſt as large as the child's head, and which ſhould be far deſcended into the pelvis.

Whereas, on the contrary, if the practitioner is impatient, and injudiciouſly deſires the woman to aſſiſt her pains by holding her breath, at the ſame time by forcibly ſtriving and bearing down; and beſides this, if he very officiouſly attempts to aſſiſt with his hand in touching her, and thereby endeavours, however ſlowly, to dilate the uterine parts, he will greatly hurry the woman, and he will not only inflame the uterine parts, but will ſo irritate them as through conſent of parts perhaps to throw the woman into hyſterics, but at leaſt to excite ſickneſs and vomitings; and thus occaſion the woman to force and bear down violently and involuntarily, ſubverting the natural and ſpontaneous dilatation of the os uteri, vagina, perinæum, &c. ſo very proper for the woman's ſafe delivery and recovery.

And now, granting, that the os uteri is ſufficiently dilated, that the membranes are broken, and the waters are diſcharging, and that the head is ſo far advanced as to begin to bear upon the anus, nay upon the perinæum, &c. nevertheleſs the practitioner even now, inſtead of encouraging the woman to bear down, ſhould particularly deſire her to the contrary, and to uſe no more efforts to forward her delivery than the mere natural bearings of her pains; nay he ſhould deſire her rather to ſuppreſs them; for at this period of labor much attention ſhould be paid to the woman, for the ſlower or leſs forcing the pains are, the perinæum, &c. will have more time given it as gradually to diſtend; and the os externum will then ſo expand and gradually enlarge, that the child's head, inſtead of being forced, will rather gently and ſlowly ſlip through it into the world: the practitioner, therefore, at all times in natural labors ſhould never touch the woman with any other view than to know how labor advances; his aſſiſtance in any other manner is unneceſſary; for, if he now attempts to dilate the perinæum, &c. he will do much miſchief. Hence as the head protrudes through the os externum preſſing on the perinæum, and greatly extending it outwards and backwards, the practitioner ſhould only apply the palm of his hand on it, in order to give it ſupport; which muſt be regulated according to the woman's bearings, &c. and he ſhould now very particularly exhort the woman even not to bear with her pains; for if ſhe does, and particularly with a ſudden and forcible exertion, he ſhould then as forcibly preſs his hand againſt the perinæum, for without ſo doing and retarding the ſudden expulſion of the child's head, it is ten to one, but that the perinæum by ſuch ſudden bearing exertions will burſt, and be rent even into the anus, *a dreadful conſequence!* Whereas by the woman's retarding, or rather as much as poſſible ſhe can ſuppreſſing or withholding her pains in their bearing down, the child's head will ſlowly ſlide through the os externum without hurting the perinæum, &c. in any degree whatever, or any accident whatever occurring.

The child's head being thus ſlowly and ſafely delivered through the os externum, the further deliverance of the child's body muſt not be immediately attempted, nature muſt be waited on. She has now more to do internally within the uterine ſyſtem, and particularly within the cavity of the uterus, than what ſome practitioners may think; for by the ſlow and gradual delivery of the head through the os externum, the neceſſary contraction of the fundus uteri as gradually takes place, thereby the placenta as gradually begins to be ſeparated from the fundus uteri, and that without any enſuing flooding; and further, by letting the body of the child reſt, or rather retaining it within the vagina during the next natural returning pain or few pains of the woman, the fundus uteri will further contract, which gives a more ſafe, perfect and natural ſeparation of the placenta: all this a good, humane and careful practitioner ſhould conſider within his mind, ſo that when the natural pains of the woman come on for the expulſion of the child's body, he muſt not attempt officiouſly to aſſiſt the delivery thereof by pulling at the head to extract the ſhoulders, &c. but, on the contrary, he ſhould rather prevent the ſudden and forcible expulſion of the ſhoulders, by ſupporting or rather moderately holding the child's body within the vagina againſt the violent expulſive efforts or forcings of the labor pains; but when the pains recede, then to let the child's body, as of its own accord, ſlowly and gradually paſs through the os externum into the world; hence in a natural labor the woman ſhould be delivered merely by her own natural efforts or pains, and which ſhe herſelf ſhould not attempt to increaſe by any exertion, as holding her breath, forcing or bearing down, nay by rather reſtraining or withholding her pains, her uterine parts will gradually enlarge, diſtend and open, and every part of the child will paſs or rather glide through the os externum, &c. ſlowly and gradually, with very little pain to herſelf, and without lacerating the perinæum, or any hurt or injury whatever happening; and beſides theſe advantages, as there will be time for the fundus uteri,

&c. gradually to contract, and thereby ſlowly, perfectly and naturally to ſeparate and caſt off the placenta, no undue retention of it will happen, or any violent flooding enſue therefrom.

Whereas, on the contrary, if the woman is violent in her pains, bearing or forcing downwards with all her ſtrength; or more particularly, if the practitioner is impatient to deliver the body of the child immediately after the head is born; and particularly, if it happens to be a ſmall child, and the uterus much diſtended with water, he will prevent the natural, gradual and ſpontaneous ſeparation and expulſion of the placenta; for generally the uterus will contract where there is leaſt reſiſtance to it; ſo when the child is very ſuddenly delivered, the contraction will always be towards the cervix uteri (for as yet there is an adheſion between the fundus uteri and the placenta), and occaſion what is called the hour-glaſs contraction of the uterus, retaining the placenta as within a purſe, with its mouth drawn cloſe together by its ſtrings: and now, if the practitioner is not very circumſpect and careful, he will create much miſchief, and even occaſion death itſelf; for if he is in a hurry to extract the placenta, not giving time for a proper ſeparation of it, and relaxation of the hour-glaſs contraction of the uterus, or not thinking that there may be a twin child* behind, if he pretends very unthinkingly to extract the placenta by pulling at the funis with ſome degree of force, if that is weak and ſlender it will for the moſt part break, and leave the body of the placenta behind; and then perhaps, if he is impetuous, he will be ſo very imprudent as raſhly to introduce his hand into the uterus; and if then he finds not another child within the uterus, he will violently tear off, and ſeparate the placenta, and thus extract it, leaving the connecting or anaſtomoſing veſſels of the uterus with the placenta ruptured, open and bleeding; hence the woman will ſoon become faint from loſs of blood, and hence will ariſe many other very dangerous and deplorable diſeaſes often terminating in death. Again, if there is no twin child within the uterus, and the funis is ſo ſtrong as to withſtand breaking on being forcibly and violently pulled, then there will enſue either a very diſagreeable bearing down of the vagina, or, as I have ſeen, a total and complete inverſion of the uterus, and from which death has ſoon followed.

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* As a woman may have twin children, it is neceſſary ſoon after one child is born, the funis umbilicalis tied and cut, and the child delivered to the nurſe, for the practitioner to touch the woman, in order to know, before he thinks on the extraction of the placenta, if there be a twin child remaining within the uterus; if ſo, and the head preſents, the delivery of it muſt be left to nature, and to the natural efforts of her pains; but if any other part preſents, it then muſt be delivered as in preternatural labors; after which the practitioner muſt leave the ſeparation of the placenta to nature, and then to be extracted as in other natural labors.

Therefore, I would adviſe every practitioner to proceed ſlowly and tenderly in delivery, to give time for a gradual, natural and neceſſary contraction of the fundus uteri, ſo that the perfect and natural ſeparation of the placenta may take place; and further, for the ſafe and total expulſion of the placenta, the practitioner ſhould, after the child is born (although there is no twin child behind in the uterus), wait patiently

for

for ſome time, that it may be ſeparated by nature, and protruded from the uterus into the vagina by the natural pains of the woman; and indeed by a ſlow and gradual conducting of the labor, the placenta generally will be ſafely, gradually and perfectly ſeparated from the fundus uteri, and will then for the moſt part be naturally protruded ſo far as to fall down into the vagina almoſt immediately after, or as ſoon as the child is delivered; and if ſo ſeparating in time of labor, and laying in the vagina, it then ſeldom cauſes or creates much after pain, nay little or no pain; therefore, after the practitioner has waited for ſome time after delivery and no returning after-pains of the woman occur, as generally in ſuch caſes do not (all which obſervation and experience will ſoon teach him to know), he may then touch the woman; and on finding the placenta laying within the vagina, he may then be aſſured, that the fundus uteri is properly contracted, and that the placenta is perfectly, totally and naturally ſeparated therefrom, and is deſcended into the vagina, and that by a gentle bearing down of the woman, as if going for ſtool, and at the ſame time the practitioner gently drawing the funis downwards, the placenta may be very ſafely extracted, and ſlipped through the os externum, and thus the woman will be ſafely delivered.

But if the placenta does not ſeparate from its adheſion to the uterus almoſt immediately after the child is delivered, and cannot be felt in the vagina by the practitioner's finger when introduced into the vagina, he muſt then wait patiently until the ſeparation of the placenta takes place by a ſtill further contraction of the uterus, which is known by pains alternly coming on, which are the more cloſe contractions or natural cloſing up of the uterus; if then, after having waited for ten, fifteen, twenty, nay thirty minutes, for a few after-pains to contract the fundus uteri, and to caſt off the placenta, ſo that it may be ſunk down into the vagina and there readily touched with the finger, it may then be ſafely aſſiſted along at the next occurring pains, after the manner juſt mentioned, and thus extracted. But if no pains occur after the child is de-

delivered, and the placenta cannot as yet be touched with the finger, it muſt be left to nature, and the practitioner muſt wait even if it is for ſeveral days, two, three, four, or even longer, avoiding by every means the raſh and rude introduction of the hand into the uterus *, for ſeparating it, or I may ſay tearing or rather flaying it off with the finger from the tender and irritable ſurface of the uterus. Therefore if the gentleſt efforts to extract the placenta do not ſucceed, and prove ſufficient, it muſt be left entirely to nature; for after a few days it will probably be expelled naturally, and thrown out through the os externum, and this I have known greatly to be aſſiſted by the gentle efforts or expulſive bearings as at ſtool, occaſioned merely by the return even of an emollient clyſter.

Such then are the modes † by which labors

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* Though ſo generally, but yet ſo injudiciouſly, adviſed in adheſions, or rather retentions of the placenta within the uterus.

† With reſpect to the eſpecial manner how each operation in the different kinds of labor ſhould be performed

labors ſhould be conducted, and ſuch are the accidents, injuries, &c. that may happen to women injudiciouſly treated and hurried in their deliveries. Thus much for the management of natural labors and ſafe extraction of the placenta.

It will now, ſixthly,

Be proper to mention, that there is yet another accident which may happen to a lying-in woman, and which ſome practitioners may not think of, nay perhaps never imagine, and which is equally, if not more

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formed particularly, the author has not here attempted to explain, that will be the ſubject of future diſſertations, comprehending alſo a general review of the ſeveral opinions of the different authors of midwifery, as to the particular conduct and management of pregnant, parturient and lying-in women; but in this, as a kind of introductory or general diſſertation thereunto, he has only endeavoured chiefly to ſhew and point out the neceſſity, whatever may be the mode or inſtrument neceſſary for the delivery, that it ſhould be conducted ſlowly, gently, gradually and regularly, with patience and humanity, avoiding every degree of unneceſſary force, leaving the whole entirely, or as much as poſſible, to the efforts of nature.

dangerous than any other, perhaps from not being ſuſpected; and that is from certain parts of the uterus through the hurry and violence of labor irregularly and unduly contracting, by which means certain portions of the uterine veſſels are as it were encircled and conſtricted as in a ligature, hence from ſuch conſtricted portions of the uterus ariſe many uterine complaints, as excruciating after-pains, inflammation, mortification with all its dreadful effects; and hence the ſource perhaps of every child-bed fever ſo very frequently fatal. How ſlow, how regular, how gradual, attentive and cautious, ought then every practitioner to conduct even the moſt natural labor.

Hence, to prevent any painful, ſevere, or dangerous complaint happening to women during or after their parturition (and particularly from too great hurry or officious aſſiſtance to haſten delivery), every kind of labor ſhould be conducted ſlowly, gradually and gently; and the woman ſhould be even conſtantly exhorted not to bear down, or force with her pains, or uſe any other means to increaſe the natural efforts of her labor; ſo that the child may be delivered gently, gradually and ſlowly, and with as little force as poſſible; and the ſeparation, &c. of the placenta ſhould in like manner be left to nature, it being ten to one but that ſome miſchief will ariſe, if the practitioner attempts to hurry, or imprudently aſſumes according to the labor to aſſiſt beyond what is neceſſary; for it has ever been obſerved, that raſh, impetuous and injudicious practitioners in midwifery have always the greateſt number of bad caſes, and that ariſing merely from their own too haſty, raſh, imprudent and bad management; and indeed how ſhould it be otherwiſe, as they never conſider nor reflect on the caſes that they attend, and perhaps are totally ignorant how to manage them? It is coolneſs in temper, conſtant aſſiduity, attention and length of time only, that can make a good, ſafe and experienced practitioner in midwifery.

In fine, what I have mentioned in theſe few pages I can aver to be true, from a practice of more than thirty years, and from the attendance on more than five thouſand * labors; out of theſe, I could relate many inſtances or caſes to illuſtrate what I have here aſſerted, but omit them as being tedious, and perhaps ſimilar to what other practitioners in midwifery may have alſo ſeen, probably without paying any kind of attention to them; but if any one doubt what I have here aſſerted, let them for the future obſerve, and remark every caſe that they may attend, and then I am confident they will in a little time find,

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* This number perhaps to ſome perſons may appear great, and too many to fall to the practice of one man; but the author muſt inform them that for upwards of twenty years there was no other male practitioner in midwifery than himſelf in Oxford, and but very few round it for many miles, conſequently many very tedious, dangerous, laborious and preternatural caſes fell to his attendance and care, all which he endeavoured to conduct after the manner here related, and indeed ſuch modes and treatment, as relates to the mother, child, and placenta, he has for many years inculcated amongſt his medical friends; and if it had not been for the delay of waiting for the occurrence of a number of flooding caſes at the onſet of or during labor to have ſatisfied his mind from whence the hæmorrhage really proceeded, and to aſcertain poſitively the beſt and moſt ſafe mode, &c. of conducting ſuch caſes, a ſomewhat ſimilar diſſertation to this, as relative to its other parts, would have appeared ſome years ago.

that what I have here related is nothing but the truth.

Thus much for the conduct and management of labors in general; but as the Obſtetric Forceps is of ſuch conſequence in the delivery of retarded labors, it will now,

Seventhly,

Be neceſſary to attempt geometrically to proportion and delineate the different forms of the ſingle curved Obſtetric Forceps, as mentioned in the foregoing pages; and firſt with reſpect to the common ſingle curved Forceps as delineated in

Fig. 1.

Which ſhews the two ſides of the ſingle curved Forceps connected or locked together, conſequently can only exhibit the thickneſs of the blades, their proper curvature, the breadth of their ſhanks, together with the length, thickneſs, ſhape, &c. of the handles.

But to form the ſingle curved Obſtetric Forceps geometrically, and as near as poſſible to the alterations of Dr. Smellie's Forceps, as mentioned page 10, and thereby to fix it to one general ſhape, ſize or ſtandard. Firſt, as in Fig. 1, draw in length a right line as A B eleven inches and one half of an inch, which will be the axis of the Forceps; then from the point A, ſet off ſix inches and one half of an inch towards B as at the point C, which line A C divide in its middle as at the point D, with the line E F, at right angles with the line A C; then on the line D E, ſet off one inch and the four tenths of an inch as at the point G, and again on the line D F, ſet off one inch and the four tenths of an inch as at the point H; then with the radius of four inches and one half of an inch on the line G F as from G to J, draw a curve line from A through G to C, and again, with the like radius on the line H E as from H to K, draw another curve line from A through H to the point C, and thus two regular curves as A G C, and A H C (the ſegments of a quadrant), for the internal curvature of the Forceps' blades are formed.

And now, to give the blades their proper expanſion at their ends, from the point A ſet off on each curve line A G, and A H, the ſix tenths of an inch as at the points L and M, which are the ends of the Forceps' blades, and thus the ends of the blades gain an expanſion of about the eight tenths of an inch as from L to M, and hence the length of the chord line of each blade when locked together will be, from the point C to the points L and M, about ſix inches and half the tenth of an inch.

And further, to give the blades their proper thickneſs, through the points L and M, draw a right line as the line N O, and then from the point L toward N ſet off two tenths of an inch as at P, and again from the point M towards O ſet off two tenths of an inch as at Q; then from the point G on the line G K ſet off two tenths and half a tenth of an inch as at the point R, and then on the line R J ſet off from R four inches and four tenths of an inch as from R to S, and on that radius draw a curve line from R to the point P; again, from the point H on the line H S, ſet off two tenths and half the tenth of an inch as at the point

T, and then on the line T K ſet off four inches and four tenths of an inch as from T to U, and on that radius draw a curve line from T to Q, and thus the thickneſs of the blades from their utmoſt curvature, as at the points R G and H T, is regularly formed to their ends at P L and M Q, which from their outer edge muſt be gradually rounded off to their inner as at L and M.

Again, to give the full length and curvature of each blade, firſt ſet one foot of the compaſſes at the point J, and with the other foot continue the curve line from G through C to the ſix tenths of an inch as to the point V; and again, ſet one foot of the compaſſes at the point K, and with the other continue the curve line from H through C to the ſix tenths of an inch as to the point W;—then to give the ſhanks of the blades their proper breadth from their utmoſt curvature as at R G and H T, with a radius of ſix inches two tenths and half the tenth of an inch on the line R F, as from R to the point X, draw a curve line from R to the point W as the curve line

RW; then with the like radius of ſix inches two tenths and half a tenth of an inch on the line T E as from T to the point Y, draw a curve line from T to the point V as the curve line T V, and thus the major part of the ſhanks of the Forceps' blades are formed.

But to give the ſhanks their final length and breadth, ſet off from the point C on the line C B one inch as at the point Z; then from the point W draw a right line to the point Z as the line W Z; and again, from V to Z draw another right line as the line V Z, which two right lines terminate the length and breadth of the ſhanks of the Forceps' blades, and alſo from the ſloping part of the groove for the locking part of each blade, as from W to Z, and from V to Z; and thus, are geometrically aſcertained, the length and proper curvature of the Forceps' blades, together with their thickneſs from their ends to their utmoſt curvature, and from thence the breadth or width of their ſhanks as neceſſary for their ſtrength in their different parts even to their locking parts, and alſo the ſlopes of the grooves for the locking parts of the Forceps.

As to the formation of the Forceps' handles, I can only ſay poſitively that in length from the point C to their ends as at B, they ſhould not exceed five inches; or from the point Z (the bottom part of the groove for the locking of the Forceps' blades) to B four inches, ſo that the whole length of the Forceps ſhall not exceed eleven inches and half the tenth of an inch: as to the width of the groove for the locking part, it ſhould be only juſt ſo wide as to admit eaſily the thickneſs of the ſhank of the oppoſite blade; and the cheek *a* of the locking part ſhould be of ſuch a thickneſs as one tenth of an inch, or what is neceſſary only to give them ſtrength, ſo as to keep the ſhanks of the blades ſteady (vid. Fig. 2): but theſe particulars will always vary a little to the fancy of the maker, as will alſo the ſize and ſhape of the handles, for as the handles of the Forceps if they were made entirely of ſolid iron would be very heavy, therefore the maker, as ſoon as he has formed the cheek *a*, and the breadth of the groove for the locking part and its thickneſs (which may be two or three tenths of an inch as from the points W and V to the points *b*, *b*,) of ſufficient ſtrength, ſize, &c. he then beats the remaining part of the iron into a thin plate as at *c*, *c*, *c*, *c*, ſo as not to be more than one tenth, or hardly to be more than half the tenth of an inch thick at the bottom or end of the handles as at B: the other part is made up of hard wood or horn, rivetted to it as at *d*, *d*, *d*, *d*; and then it is cut, ſloped and ſhaped, to the fancy of the maker, who for the moſt part finally covers it with leather.

But to fix in ſome reſpect the ſize, ſhape and thickneſs of the handles; firſt, through the point B at right angles with the line B Z C D and A the axis of the Forceps, draw the right line *ef*, and then on that line ſet off one inch on each ſide of the point B, as at the points *g* and *h*; then draw a right line from the point *g* to the point W, the top of the groove for the locking part of the handle, and the like on the other ſide from the point *h* to the point V, and thus is obtained a regular ſlope for forming the Forceps' handles; and further, to regulate the indentations in the handles neceſſary for the operator's firm holding them, ſet off from the point *g* on the line *g* W, firſt half an inch, then another half inch, and then one inch more, and another inch beyond that towards W, as at the points *i*, *k*, *l*, *m*; and the like on the other ſide from the point *h* on the line *h* V, as at the points *n*, *o*, *p*, *q*; then let the maker in forming the thickneſs of the handles gradually round and indent them from the points W and V, to the points *m* and *q*, about one tenth of an inch, and from whence let him again gradually ſwell them out to their full extent as at the points *l* and *p*, from thence again gradually round and indent them to the points *k* and *o*, two tenths of an inch, and from thence again gradually let them ſwell out to their full extent as at the points *i* and *n*, and then gradually round them off to their ends, as repreſented by the black wavering line from the points *b*, *b*, to the bottom of the handles at B.

Hence from this deſcription and view of Fig. 1, I believe that any artiſt may form geometrically the proper curvature of the Forceps' blades, their thickneſs, and the length and width of the ſhanks in all their ſeveral parts as neceſſary for their ſtrength, together with the regular ſlopes of the grooves for the locking parts, and the ſize, ſhape and thickneſs of their handles.

FIG. 2.

But, as it is impoſſible to ſhew the neceſſary breadth of the Forceps' blade, the thickneſs of its ſhank, and the width of the groove for the locking part, and height and thickneſs &c. of the cheek of the locking part, together with the proper curvature of the blade, &c. in one figure, it is therefore neceſſary to repreſent them in another as in fig. 2, and even here as it is impoſſible on paper to repreſent any depreſſion or curvature in a foreſhortened manner, that is, by a right line, ſo the breadth of the blades, &c. can only be given as correſpondent to the different parts of their curvature, as in Fig. 1, and therefore thereunto to conſtruct geometrically the breadth of the Forceps' blade, the thickneſs of its ſhank, with the width of the groove for the locking part, the height and thickneſs of its cheek, and breadth of the handle, firſt draw a right line eleven inches and half the tenth of an inch in length as the line A B in Fig. 2, which is the axis of the Forceps; then from the point A on the line A B ſet off the ſeven tenths of an inch as at the point C, and then on that point, and with that radius deſcribe the ſemicircle D A E, after which draw its diameter D E, and this forms the ſhape and breadth of the blade at its end; then ſet off from the point C on the line C B two inches and one tenth of an inch as at the point F, and croſs it at right angles with the line G H, and from the point F on the line G F ſet off half an inch and the half tenth of an inch, and the ſame diſtance on the line F H as at the points J and K, and thus the breadth correſponding to the utmoſt curvature of the blade is formed: then from the point F on the line F B ſet off two inches and three tenths of an inch as at the point L, which is the point of the blade's bifurcation, or diviſion of the ſurrounding iron which forms the blade; then from the point L on the line L B ſet off the ſix tenths of an inch as at the point M, through which point at right angles draw the line N O, and then on each ſide of the point M on the line N O ſet off one tenth and half the tenth of an inch as at the points P Q; then draw a right line from the point P to the point J, and likewiſe from the point J to the point D; and again, draw a right line from the point Q to K, and from K to the point E, and thus the breadth of the Forceps' blade is formed from its end to the narroweſt part of its ſhank. But as this blade, if it were compoſed of one ſolid iron plate, would be very heavy, it has therefore, to make it lighter and ſtill to have the ſame effect, been cuſtomary for the maker to take out the inner part, leaving only a ſurrounding border about the breadth of two tenths or three tenths of an inch: but, however, to form this part of the Forceps' blade, firſt ſet off from the point J on the line J F two tenths and half a tenth of an inch; and the ſame diſtance from the point D on the line DC; and the ſame from A on the line AC; and then from E on the line EC; and again from K on the line KF, as at the points R, S, T, U and V; then draw a right line from the point L to the point R, and from R to S, and then deſcribe the ſemicircle STV, on the radius of SC; and then from the point U draw a right line to the point V, and from V to L, and thus the proper breadth of the ſurrounding part or iron of the Forceps' blade is aſcertained.

And further, to form the thickneſs of the bottom part of the ſhank of the Forceps' blade, &c. firſt ſet off from the point M on the line MB half an inch as at the point W, from which point to the left hand draw at a right angle with the line WB a right line as the line WX, and then ſet off half an inch from the point W on the line WX as at the point Y, and again ſet off one tenth of an inch more towards X as at the point Z, this gives the height and thickneſs of the cheek of the locking part;—then from the point W on the line WB ſet off a quarter of an inch as at the point *a*, from which draw to the left hand at a right angle with the line *a*B the line *a b*, and on which from the point *a* ſet off one tenth and half the tenth of an inch as at the point *c*, and then from *c* ſet off three tenths and half the tenth of an inch more towards *b* as at the point *d*, which gives the width and top of the groove for the locking part; then from the point *a* on the line *a*B ſet off the ſix tenths of an inch as at the point *e*, through which point at right angles draw the line *fg*, then on each ſide of the point *e* on the line *f g* ſet off one tenth and half the tenth of an inch as at the points *h* and *i*, then ſet off three tenths and half the tenth of an inch from the point *h* on the line *hf* as at the point *k*, which gives the width of the groove at the bottom of the locking part; and then from the point *k* on the line *kf* ſet off one tenth of an inch as at the point *l*, which fixes the thickneſs of the cheek of the locking part. Hence, to form out the cheek of the groove for the locking part, draw a right line from the point *l* to the point Z, and from Z to Y, and from Y through *d* to *k*; and to form the width of the groove at the top of the locking part, draw a line from *d* to *c*, which is the top of the groove; and to form the width of the groove at the bottom of the locking part, draw a line from the point *k* to *h*, which is the bottom of the groove; and finally, to form the thickneſs of the ſhank of the Forceps' blade, draw a right line from the point *h* through *c* to the point P; and then from the point Q draw a line to the point *i*, and thus far is formed the breadth of the Forceps' blade, the thickneſs of its ſhanks, the width of the groove for the locking part, and thickneſs of its cheek.

But with reſpect to the further conſtruction of the Forceps' handles, it can only again be obſerved, that the length of the handle ſhould be four inches from the point *e*, or bottom of the groove for the locking part, to the end of the handle at the point B; and in its width towards its bottom it may be about one inch and three tenths of an inch. However to form the breadth of the handle ſo as ſomewhat geometrically to anſwer to its thickneſs in Fig. 1, draw through the point B at right angles with the line *e* B the line *m n*; and from the point B on the line *m* B ſet off nine tenths of an inch as at the point *o*; and again on the line B *n* ſet off four tenths and half the tenth of an inch as at the point *p*; then draw a right line from the point *o* to the point *l*, and again from *i* to *p*; and thus is obtained a regular ſlope (for forming the handle) from the bottom of the groove for the locking part to the end of the handle; and further, to make it correſpond with the ſhape of the thickneſs of the handles in Fig. 1, ſet off on the line *o l*, firſt, half an inch, then another half inch, and then one inch, and then another inch more towards *l* as at the points *q*, *r*, *s* and *t*; and the like diſtances on the other ſide as on the line *p i* as at the points *u*, *v*, *w* and *x*, on that line; and further, to regulate the neceſſary indentations of the handle to anſwer agreeably to thoſe in Fig. 1, let the maker in ſhaping the breadth of the handle gradually round and ſlope it on each ſide from the points *l i* to the points *t x*, about half the tenth of an inch; then from the points *t x* to the points *s w* as gradually ſwell it out to the full extent; then again, gradually round and indent it on both ſides about one tenth or one tenth and half the tenth of an inch to the points *r v*; and then again gradually ſwell it out to the full extent at the points *q u*; and laſtly, as gradually round it off to the end, as repreſented by the wavering black lines from the points *l* and *i* to the bottom of the handle as at B.

And further, with reſpect to the other parts of the Forceps, the maker muſt ever remember carefully to ſmooth, poliſh and round off every part, ſo as not to leave any kind of ſharp, prominent, or acute edge whatever; and thus by obſerving and minutely following theſe directions and geometrical proportions, one general ſtructure of the Obſtetric ſingle curved Forceps may by any artiſt be eaſily conſtructed and made; which in the hands even of the moſt inexpert practitioner, will rarely hurt or bruiſe the child's head, or compreſs it ſo in its delivery as to occaſion its death; and never in the hands of the expert and judicious practitioner will any way injure either the mother or child.

Fig. 3.

But as there are ſome caſes, particularly thoſe mentioned from page 15, 16 and 19 to 23, that require, for the ſafe delivery of the woman and child, one blade of the Forceps to be much more narrow than thoſe of the ſingle curved Forceps already deſcribed and delineated in the two foregoing figures, it will be here neceſſary to illuſtrate ſuch a blade, as in Fig. 3; firſt it muſt be obſerved, that this narrow blade muſt be made of an entire plate of iron, and muſt have the ſame thickneſs, the ſame curvature, the ſame ſized ſhank, groove, cheek, &c. for the locking part and handle as the ſingle curved Forceps delineated in Fig. 1 and 2; but the breadth of the blade muſt not be more than an inch wide towards its top; and about the eight tenths of an inch at its utmoſt curvature, from which to the narrow part of its ſhank it muſt gradually decreaſe in its breadth to the three tenths of an inch.

But, to conſtruct it geometrically, firſt draw a right line eleven inches and half the tenth of an inch, as the line A B in Fig. 3, which is the axis of the Forceps; then from the point A towards B ſet off half an inch as at the point C, and on that radius deſcribe the ſemicircle D A E, and then draw its diameter as the line D E; after which, from the point C on the line C B ſet off two inches and three tenths of an inch as at the point F (which correſponds with the utmoſt curvature of the blade as in Fig. 1), and immediately croſs it at right angles with the line G H, and then on both ſides of the point F ſet off on that line four tenths of an inch as at the points J and K; again, from the point F on the line F B ſet off two inches and nine tenths of an inch as at the point L, and at right angles croſs it with the line M N, and then on each ſide of L ſet off on the line M N one tenth and half the tenth of an inch as at the points O P; after which, from the point O draw a right line to J, and from the point J to D, and then again from P to K, and from K to E, and thus the breadth of this narrow blade of the ſingle curved Forceps will be conſtructed; and as the conſtruction of the other parts are the ſame as deſcribed and delineated in Fig. 1 and 2, to complete the whole of this ſide of the Forceps, the artiſt is referred thereunto, and when finiſhed will readily join either with the ſide of the Forceps Fig. 2, or with the reflected blade Fig. 11, 12, whenever ſuch caſes as are mentioned from page 15, 16 and 19 to 23 occur, ſo as to require its application.

Fig. 4.

But as there may alſo happen other ſuch caſes as are mentioned from page 15, 16 and 19 to 23, that will require a much narrower blade of the Forceps than even that of Fig. 3, for its ready introduction into the pelvis, and ſafe delivery of the woman and child; therefore to form ſuch a blade it was neceſſary to divide one ſide of the ſingle curved Forceps into two parts, and which are joined together at the point of the blade's uſual bifurcation by the contrivance of a little hinge, and by diverging the handles a little therefrom the two fangs will open and ſhut at pleaſure, ſo that after the fangs are introduced into the pelvis in their ſhut or cloſe ſtate, they will afterwards again open and ſpread on the child's head, and have equally as much effect as the entire blade of Fig 2, or of any other kind of Forceps.

But to delineate this divided or fanged ſide of the ſingle curved Forceps geometrically, firſt draw a right line eleven inches and half the tenth of an inch as the line A B in Fig. 4, which is the axis of the Forceps, then ſet off from the point A five inches and one tenth of an inch, as at the point C (which is the center of the hinge which joins the two parts together), and then on the radius of A C, deſcribe through the point A the ſegment of a circle as D E, and then from the point A on the ſegment D A ſet off ſeven tenths of an inch, and the like diſtance on the ſegment A E as at the points F and G, which is the utmoſt expanſion of the fangs, and nearly equal to the breadth at the top of the blade Fig. 2; and further, from the point F on the ſegment F A ſet off three tenths of an inch, and the like from the point G on the ſegment G A as at the points H and J, which is the breadth of each fang at its end.

Then to delineate the hinge of the two fangs, firſt, through the point C, at right angles with the line A B, draw the line K L, and from the point C on each ſide of it on the line K L ſet off one tenth and three tenths of a tenth of an inch as at the points M and N; after which, from the point C on the line C A ſet off two tenths and the two tenths of a tenth of an inch, and the like from C on the line C B as at the points O and P; then on the point M ſet one foot of the compaſſes, and on the radius of M N, from the point O through N to P, deſcribe the ſegment of a circle as the ſegment O N P; and again, ſet one foot of the compaſſes on the point N, and on the radius of N M deſcribe from the point P through M to O the ſegment of a circle as P M O, and thus the ſize, ſhape, &c. of the hinge, which connects the two parts of this ſide of the Forceps together, is formed *. Then from the point C on the line

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* To illuſtrate more perfectly the nature of this hinge, and to ſhew the manner how the two parts of this ſide of the

line C B ſet off the ſix tenths of an inch as at the point Q, and croſs it at right angles with the line R S, and from the point Q [illegible] on

[illegible]

the Forceps are thereby particularly connected together; firſt, let it be underſtood that Fig. 5 and 6 exactly repreſent the ſize of the hinge, and part of the fangs and ſhank of Fig. 4, unconnected, by which it is obvious that on each part over the center C there is a ſemielliptical knob to be raiſed, as O N P in Fig. 5, and O M P in Fig. 6, each correſpondent with Fig. 4, and out of which the ſeveral parts of the hinge are to be formed.—Secondly, it muſt be underſtood, that through the middle of the knob of Fig. 5, ſideways and longways in direction from the fang part to the handle there muſt be cut a notch two fourths of its breadth to the center as from O through C to P, and that then of the ſame breadth there muſt be further indented a ſemielliptical groove ſimilar to the ſemielliptical ſhape of the knob, and ſo as to make the whole cavity repreſent the ſhape of a myrtle leaf, as O M P N in Fig. 4.—And thirdly, it muſt alſo be underſtood, that the upper and under ſide of the knob over the center C of Fig. 6, muſt be alſo cut away ſideways and longways in the direction from the fang to the handle, each one fourth of its thickneſs to its center C, as from O through C to P, and that then they are to be further indented ſo as to receive the ſemielliptical cheeks of the cavity of Fig. 5, and thus the middle part of the knob of Fig. 6. will appear as a knuckle in ſhape to a myrtle leaf, which knuckle of Fig. 6 is to go into the on each ſide of it on the line R S ſet off one tenth and half the tenth of an inch, as at the point T and U; and then from the point T to the point F draw a right line, and the ſame from the point C to the point H, and again from C to the point J, and once more from the point U to the point G, and thus the breadth of the two fangs expanded is formed with the thickneſs of

cavity of Fig. 5, and when they are ſo fitted as to move eaſily on each other, then through the center C they are to be rivetted together. But, further to ſhew the nature of the hinge connecting the two parts of this ſide of the Forceps together, let it again be underſtood, that Fig. 7 and 8 repreſent exactly the breadth of the ſhank and thickneſs of the knob where the hinge is formed, ſo that when the cavity of the groove of Fig. 5, and the knuckle of Fig. 6, are formed, that then the croſs ſection of the cavity of Fig. 5 will appear very ſimilar to the notch in Fig. 7, and that the croſs ſection of the knuckle of Fig. 6 will appear very ſimilar to the projection of Fig. 8, which projection *a* of Fig. 8 being put into the cavity *b* of Fig. 7, and rivetted together through their centers C, the joint of the hinge will appear as in Fig. 9; hence may eaſily be perceived the conſtruction of the hinge connecting the two parts or fangs of this ſide of the Forceps together.

ſome part of the two ſhanks of this ſide of the forceps.

But further to illuſtrate the other parts of the ſhanks, and the formation of their handles, together with the groove of the locking part, its cheek, &c. belonging to the two parts of this ſide of the Forceps, it will be proper to refer the artiſt to

Fig. 10.

Which ſhews the two fangs ſhut cloſe together, and the handles expanded. But to delineate them geometrically—firſt, draw a right line, which is the axis of the Forceps, eleven inches and half the tenth of an inch as the line AB Fig, 10; then from the point A on the line AB ſet off five inches and one tenth of an inch as at the point C, the center of the hinge joining the two parts together, and on the radius of C A deſcribe through A the ſegment of a circle as DAE, and then on each ſide of the point A, on that ſegment, ſet off towards D and E three tenths of an inch as at the points F and G, which is the breadth of each fang at its end, making the whole breadth at the ends when thus cloſed together ſix tenths of an inch; then at the point C deſcribe, as in Fig. 4, the hinge on which the two fangs move and are connected together. Again, from the point C on the line C B ſet off the ſix tenths of an inch as at the point H, and through that point at right angles with the line C B, draw the right line J K, and on that line on each ſide of the point H ſet off two tenths of an inch as at the points L and M, then from the point L to the point F draw a right line, and another from the point M to the point G, and thus is formed the breadth of each fang, whoſe end at their outward points F and G muſt be a little rounded off as in Fig. 10. And further, to form the remaining parts of the ſhanks and the handles of this ſide of the Forceps when expanded, firſt, from the center of the hinge at C ſet off on the line C B five inches nine tenths and half the tenth of an inch as at the point B, and then through B deſcribe the ſegment of a circle as N B O, and then on each ſide of the point B ſet off five tenths of an inch as at the points P and Q; then draw a right line from the point P to Q, and from Q to C, which lines are the inſide lines of the two handles to this ſide of the Forceps, and which gives between them the proper diſtance for the expanſion of the handles when the fangs are ſhut, and which gives an equal expanſion to the two fangs when the handles are ſhut as in Fig. 4.

But further, to form out the ſhank, handle, &c. to the fang of the left part, firſt ſet off from the point C on the line C P one inch nine tenths and half the tenth of an inch as at the point R, from which at a right angle to the left draw the right line S R, and then from the point R towards S, ſet off one tenth and half a tenth of an inch as at the point T, then draw from T to the point L a right line as the line T L, and thus it forms out and finally finiſhes on this part the thickneſs of the ſhank down to the bottom part of the groove for the locking part; but as the groove and cheek of the locking part and the reſt part of the handle on the left part of this ſide of the Forceps are the ſame as thoſe of Fig. 1 and 2, the artiſt is referred thereunto in finiſhing this part of the Forceps.

ceps. But finally, to form out the ſhank and handle to the fang on the right part of this ſide of the Forceps, from the point C on the line C Q ſet off one inch nine tenths and half the tenth of an inch as at the point U, and from which at a right angle with the line C Q, draw to the right hand the line U V, and then from U towards V ſet off one tenth and the half of a tenth of an inch as at the point W, then draw a right line from the point M to the point W, and this finally forms the thickneſs of the ſhank of the right fang as far down as to be even with the bottom of the groove for the locking part of the left fang; after which, the artiſt may beat out the iron to its proper length and thickneſs, ſo as to be at the bottom of this handle not above half the tenth of an inch thick as at X, X, and to which a piece of hard wood or horn as Y, Y, muſt be rivetted, and then finally formed, ſhaped, &c. according to Fig. 1 and 2.

Fig. 11.

With reſpect to Fig. 11, it ſhews the reflection of one blade of the Forceps on the other blade as mentioned page 34. Its application is to ſuperſede in many caſes of retarded labors, if poſſible, the uſe of thoſe very dangerous and horrible inſtruments the blunted hook, crotchet, and ſuch like.

But to delineate it geometrically proceed as in Fig. 1. And when its ſeveral parts are marked out, then as in Fig. 11, to reflect one blade, firſt, ſet one foot of the compaſſes on the point C, and from the point V on the radius of C V, the ſix tenths of an inch, draw a curve line from V until it biſects the curve line C H as at the point a; then from the point G on the line G H ſet off two tenths and half the tenth of an inch as at the point b, and then on the radius of b J draw a curve line from the point b towards the point L (the full end of the ſingle curved blade of Fig. 1.), ſo as to be correſpondent with the line G L, to about three fifths of the curve line GL, or one inch and eight tenths of an inch from G towards L, as at the points *c* and *c*, which fixes the end of the reflected blade; and thus the thickneſs of the upper part of the reflected blade is alſo given as from the points G b to the points c c, the end of which muſt be rounded off as in Fig. 11; and further, from the point b ſet off three inches and three tenths of an inch on the line b J as at the point d, and then draw a curve line from the point b to the point a as the curve line b a; which forms the breadth of the reflected ſhank of this ſide of the Forceps; but to give room for the reflected blade to join readily, eaſily, and unite evenly with the other blade, from the point C on the line C a, ſet off one tenth and half a tenth of an inch as at the point e, and then on the line G J ſet off four inches and one tenth of an inch as at the point f, and on that radius deſcribe a curve line from G to the point e, as the curve line G e, and thus a little ſpace as at g will be left between the two ſhanks, ſo that the ſhank of the reflected blade will readily move over the other as that of Fig. 3. And to make their blades lay evenly together, the maker muſt give their ſhanks a little bend ſideways over the groove, and indeed he muſt ever remember, that there is to be ſuch a little bend (which cannot be deſcribed by line, or hardly be perceived by ſight) always given to the ſhank of the other blades, as is neceſſary to ſet the ends of the blades directly oppoſite to each other; and laſtly, to finiſh this reflected blade of the Forceps, the curve line G C muſt be continued through the point V one tenth and half the tenth of an inch as at the point h; and then from the middle of the curve line V a as at the point i draw a right line from i to h, and thus a little hook is formed, whoſe point h muſt be a little rounded off, and thus it ſerves as a catch for the ſupport of the reflected blade on the upper part of the groove for the locking part belonging to the oppoſite ſide of the Forceps, by which means the reflected blade is kept ſteady, and the handles of the Forceps are ſo firmly locked together, that they will not ſeparate nor ſlip from each other in extracting the infant's head; for it muſt be obſerved, that the action of the reflected blade of the Forceps is not on its concave ſide, that ſide has no power merely of itſelf on the head of the infant as being within it; and indeed it has no power on the head except as ſerving only by its convex ſide to preſs the bones and integuments of the ſkull cloſe together againſt the ~~convex~~ concave ſide of the narrow blade Fig. 3, that is applied over the outſide of the head, ſo that a firm hold is ſupported and kept between them on the integuments, &c. of the head, which could not ~~be~~ ſo regularly, or to ſo good a purpoſe, be accompliſhed by the operator's hand merely by ſqueezing or preſſing the handles together, if there was not this catch to ſupport the convex ſide of the reflected blade againſt the ~~convexity~~ concavity of the other blade placed over the outer part of the child's head: hence, by this catch preventing the reflected blade from ſlipping down when placed within the ſkull, and by thus enabling the blades to keep between them a firm hold on the integuments and bones of the ſkull, and likewiſe aſſiſting the ~~convexity~~ concavity of the blade Fig. 3, placed on the outer part of the head, to act as a kind of hook or vectis thereon, the head may probably be drawn down and extracted without having recourſe to either of thoſe terrible inſtruments the blunted hook, crotchet, or any ſuch like.

Fig. 12.

As to Fig. 12, it ſhews the reflection of the blade ſeparately and diſtinctly by itſelf. But to delineate it geometrically without referring to Fig. 1, firſt, draw a right line eleven inches and one half of an inch as the line A B in Fig. 12, and from the point A ſet off ſix inches and one half of an inch as at the point C; then divide the line A C in its middle as at D with the right line E F at right angles with the line A C; then on the line D E ſet off from D towards E one inch and the four tenths of an inch as at the point G, and again on the line D F ſet off from D towards F one inch and four tenths of an inch as at the point H; then from the point H on the line H E ſet off four inches and a half as at the point K, and on that radius draw a curve line from the point H to the point C as the curve line H C; and again, with the like radius on the line G F, as from the point G to the point J, draw a curve line from G to A as the curve line G A; and then on that line from the point G towards A ſet off one inch and eight tenths of an inch as at the point L, which is the end of the reflected blade; and then from the point G on the line G D ſet off two tenths and half a tenth of an inch as at the point M, and on the radius of M J deſcribe a curve line towards A, ſo as to be correſpondent with the line G L as the curve line M N, which gives the full thickneſs of the upper part of the reflected blade as from G M to L N, the end of which is to be rounded off as in Fig. 11; then from the point C on the line C H ſet off one tenth and the half of a tenth of an inch as at the point O, and again from the point C on the line C H ſet off ſix tenths of an inch as at the point P; and then from the point M on the line M J ſet off three inches and three tenths of an inch as at the point Q, and on that radius deſcribe a curve line from M to the point P as the curve line M P, and then from the point G on the line G J ſet off four inches and one tenth of an inch as at the point R, and on that radius deſcribe from G to O the curve line G O, which forms the breadth of the reflected ſhank of this blade of the Forceps; and further, to form the reflection of the blade with its hook, ſet one foot of the compaſſes on the point J, and on the radius of J C, deſcribe from C downwards to the right hand a curve line ſeven tenths and half one tenth of an inch to the point S as the curve line C S, and then on the line C S ſet off from C ſix tenths of an inch as at the point T, and on that radius at C deſcribe the curve line from T to P, which gives the reflection of the blade; and then to form its hook, from the middle of the curve line P T as from the point U draw a right line to the point S, and thus the hook (whoſe point muſt be a little rounded off) is formed for the ſupport of the reflected blade when connected with that of Fig. 3. And finally, to finiſh the ſhank of this blade, ſet one foot of the compaſſes on the point K, and continue the curve line from H to C through the point C ſix tenths of an inch as to the point V, then from the point C on the line C B ſet off one inch as at the point W, and then draw a right line from the point T to W, and from V to W, which is the end of the ſhank of the reflected blade, and it alſo gives the proper ſlope for the groove of its locking part as from V to W, and thus is delineated geometrically the length, thickneſs and proper curvature of the reflected blade of the Forceps, with the width and reflection of its ſhank, together with the ſlope of the groove for its locking part; as to its other parts, they are the ſame as delineated in Fig. 1, to which for directions in their final conſtruction the artiſt is particularly referred.

Fig. 13.

But further, with reſpect to the reflected blade of the Forceps as delineated in Fig. 11 and 12, it is neceſſary, for the ſame reaſons given for illuſtrating Fig. 2, to mark out its breadth, &c. in another figure, as in Fig. 13. But firſt it muſt be obſerved, that this blade muſt be made of a plate of iron ſimilar to that of Fig. 3 in every reſpect except in length, & reflection, and as it is always to be uſed with that narrow blade, ſo it is neceſſary that they ſhould correſpond in their breadth, though not in their length, for as the narrow blade Fig. 3 is always to be applied over the head, and the reflected blade is always to be introduced within the ſkull, after it has been opened with a perforator, ſo the reflected blade is not required to be ſo long as the other by at leaſt an inch, for reaſons ſo obvious to every practitioner that it is unneceſſary here to mention them.

But to conſtruct geometrically the breadth of the reflected blade ſo as to correſpond with the breadth of the narrow blade Fig. 3, firſt, draw a right line ten inches and half the tenth of an inch as the line AB in Fig. 13, which is the axis of the Forceps; then from A towards B ſet off four tenths and half a tenth of an inch as at the point C, and on that center and with that radius deſcribe the ſemicircle DAE, and then draw its diameter DE; then from C on the line CB ſet off one inch, three tenths and half the tenth of an inch as at the point F, and croſs it at right angles with the line GH; after which ſet off on that line on both ſides of F four tenths of an inch as at the points J and K, then ſet off from F on the line FB two inches and nine tenths of an inch as at the point L, and draw a line through L at right angles with the line LB as the line MN; then on the line MN on both ſides the point L ſet off one tenth and half a tenth of an inch as at the points OP; then from the point O draw a right line to the point J, and from J to D, and again from P to K, and from K to E, and thus the breadth of the reflected blade of the ſingle curved Forceps is formed: as to the further conſtruction of its other parts, they are the ſame as thoſe of Fig. 2, to which the artiſt is referred for further inſtructions to finiſh this ſide of the Forceps, and when completed, will readily join with the narrow blade Fig. 3, whenever ſuch caſes occur as are mentioned page 34, ſo as to require its uſe.

Thus much for the geometrical conſtruction, &c. of the different kinds of blades of the ſingle curved Forceps as delineated in Fig. 1, 2, 3, 4, 10, 11, 12, and 13, from a view of which, and from a compariſon of their ſeveral proportions with thoſe of the real inſtruments, any practitioner in midwifery may readily perceive whether or not the maker has properly conſtructed them: but, however, in ſuch a compariſon, though it can be an error of no conſequence, yet it is neceſſary here to be obſerved, that if each figure of the Forceps was to be minutely and correctly examined by an abſolute meaſurement according to the deſcription given, there would perhaps in ſome of their parts be found a little difference in their geometrical delineation, as perhaps the half of a tenth of an inch, from what their proportions ſhould have been as mentioned in their ſeveral deſcriptions, and this ariſing from ſome little accidental incorrections of the engraver, but chiefly from the redrying of the paper after its having been neceſſarily dampped for receiving properly the impreſſions of the figures from their engravings; but, if any artiſt will draw on a ſmooth even piece of paper any one or all of the figures of the Forceps as repreſented, according to the deſcription given, he will find, that the proportions are juſt, and that every part will correſpond, and that the figure or figures will then be perfectly and accurately delineated.

In fine, with reſpect to the figures, let it be obſerved, that Fig. 1 ſhews the real and abſolute length, proper curvature, together with the proper thickneſs of the blades, the breadth of their ſhanks, the ſlopes of the grooves for the locking part, with the width of the cheek, and the ſize, ſhape and thickneſs of the handles.

Fig. 2, 3, 4, and 10, ſhew the different breadths of the different blades of the Forceps only as relative in length to the curvature of Fig. 1; but not their abſolute length, as it is impoſſible to delineate a curve in a foreſhortened manner by a right line, ſo the artiſt in making the different kinds of blades, as repreſented in Fig. 2, 3, 4, and 10, muſt only obſerve their different breadths as correſpondent to the axis of the Forceps in reſpect to the length of their curvature, ſo in forming their breadth according to the length of their curvature as in Fig. 1, the artiſt muſt always meaſure from the ſhank beginning from the upper part of the groove of the locking part. As to the other parts of Fig. 2, 3, 4, and 10, they repreſent the thickneſs of the ſhanks of the blade, and the breadth of the groove for the locking part, with the thickneſs of its cheek, and the breadth and length of the handle.

Fig. 5, 6, 7, 8, and 9, repreſent the mechaniſm of the hinge connecting the two fangs of the divided blade of the Forceps.

Fig. 11 and 12 ſhew the curvature, length, &c. of the reflected blade of the Forceps, the one as connected with that of Fig. 3, as Fig. 11; the other by itſelf as Fig. 12; and Fig. 13 ſhews its breadth, &c.

But in ſhewing the breadth of the different kinds of the Forceps' blades, it muſt further be obſerved, that by the poſition of the groove for the locking part, &c. to the left hand, the convexity of the curvature of the blade is ſuppoſed to be uppermoſt, but in the reflected blade Fig. 13, it is ſuppoſed that the concave ſurface of the blade is uppermoſt, therefore the artiſt in making the ſide of the Forceps with its blade reflected muſt remember this, or elſe he will perhaps ſet the groove of the locking part with its cheek, &c. on the wrong ſide, and conſequently will revert the breadth of the handle, &c. and thus will give himſelf much trouble to alter it, as it will not then join with any of the other blades, and particularly with that of Fig. 3, along with which it ſhould always be applied in ſuch caſes as are mentioned from page 32 to 36.

How far I have aptly fixed the length, curvature, thickneſs, and other dimenſions of the ſeveral parts of the different forms of the ſingle curved Obſtetric Forceps to geometrical proportions, &c. I cannot ſay, therefore I muſt leave every practitioner in midwifery to judge of it as beſt pleaſes himſelf, conceiving in my own mind that geometrical proportions are the moſt certain and beſt proportions that can be obſerved in the conſtruction of any inſtrument, machine, &c. as then one artiſt as well as another can always therefrom regularly and perfectly make it; and beſides, it is evident, that when any machine or inſtrument can be thus conſtructed, it is more likely to anſwer in every reſpect the intentions of its conſtruction much better than if it had only been made, formed, ſhaped, &c. by any random method, as by ſight, cuſtom, or fancy, &c. of the maker.

Thus much for the geometrical proportions and delineations as neceſſary for conſtructing the different parts and various forms of the ſingle curved Forceps; it now remains only to be obſerved, that with five of the before-mentioned ſides of the ſingle curved Forceps, variouſly changed and connected together, five different pair of Forceps may be formed, each adapted to certain different and particular caſes of retarded labors.

As firſt, two blades of Fig. 2 connected together and forming the common ſingle curved Forceps as in Fig. 1, to be applied in ſuch caſes of retarded labors even in a well formed pelvis, where, from a wrong preſentation of the head, or from its largeneſs or length it reſts within the pelvis and cannot proceed any further.

Secondly, as the narrow blade Fig. 3 connected with the blade Fig. 2.

Thirdly, as the fanged blade Fig. 4 or 10 with the blade Fig. 2.

Fourthly, as the narrow blade Fig. 3 with the fanged blade Fig. 4 or 10.

Each of theſe particularly are to be applied according to the preſentations of the child's head in ſuch caſes of retarded labors from certain peculiar diſtortions of the pelvis preventing the natural expulſion of the child's head.

And fifthly, as the reflected blade Fig. 12 and 13, connected with the narrow blade Fig. 3, as in Fig. 11, which is to be applied in ſuch caſes of retarded labors, ariſing, either from ſo great a diſtortion of the pelvis, or largeneſs of the child's head, as to require for the ſafe delivery of the woman the head to be opened, in which caſe the narrow blade Fig. 3 is to be applied over the head, and the reflected blade Fig. 12 is to be introduced within the ſkull, and then connecting or locking them together as in Fig. 11, a firm hold of the integuments and bones of the ſkull is ſecured, and thus the head may be drawn through the pelvis and delivered.

Such then are the ſeveral conſtructions, applications and various connections or junctions of the different ſides of the ſingle curved Forceps, which in every part I have endeavoured conciſely to deſcribe, explain, &c. and with accuracy to delineate geometrically.

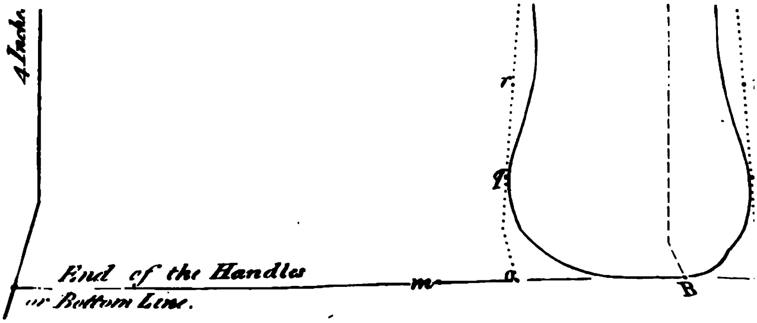
And now, Sir, with all due reſpect, &c. let me ſubſcribe myſelf,

Your much obliged,

humble Servant,

R. RAWLINS.

THE END.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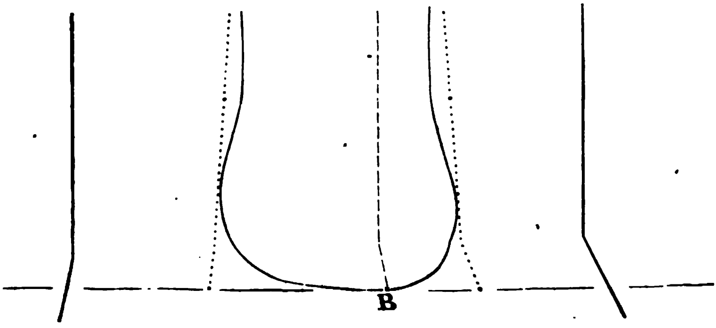
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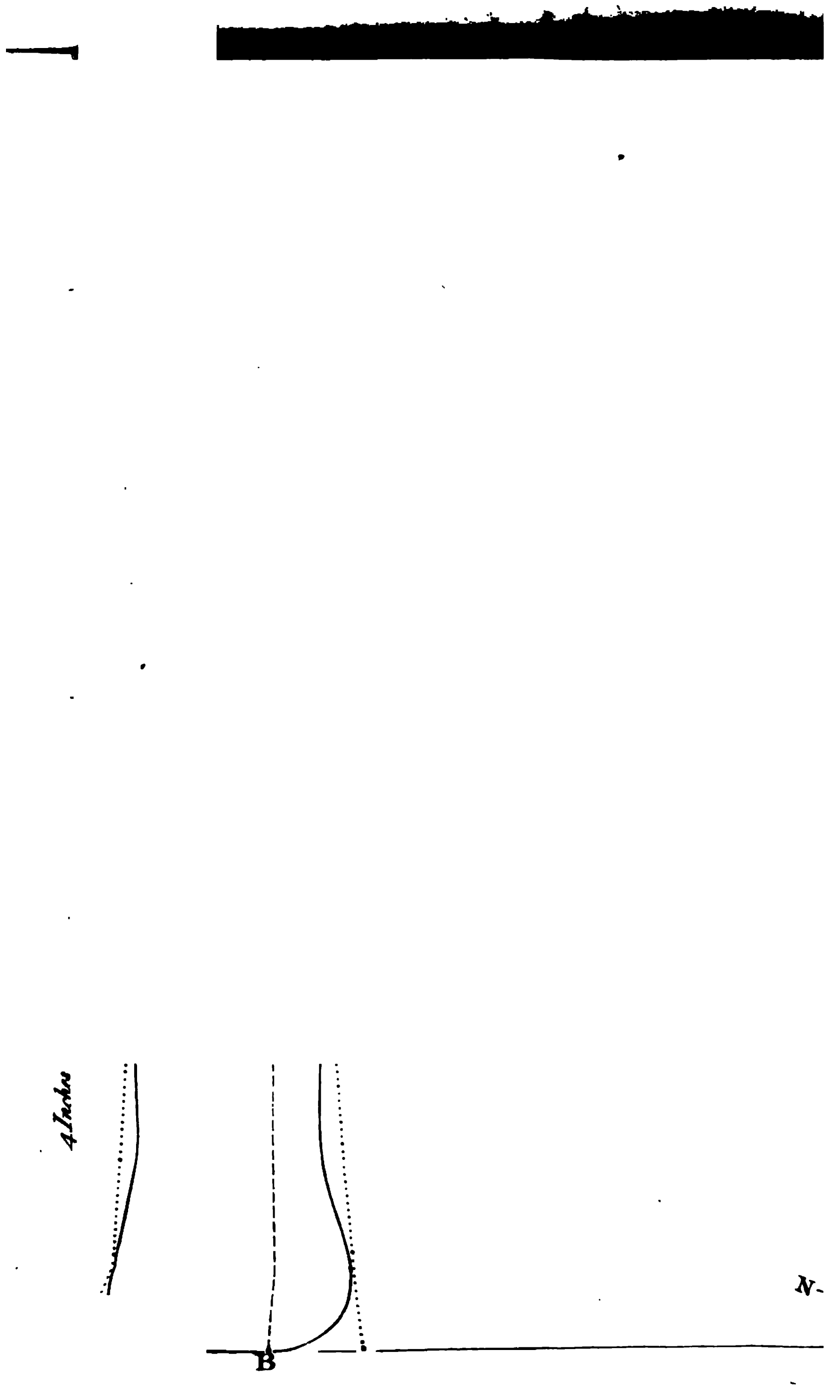
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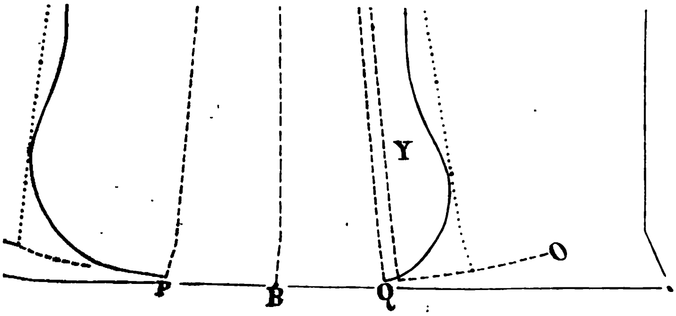
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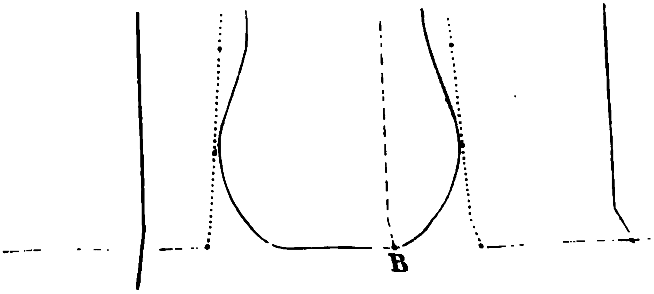
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